University of Alberta

The Effect of a Multidisciplinary Outpatient Clinic on Wait Times for Cardiology Consult

By

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Canada

Dedication

This thesis is dedicated to my husband Lorne, my daughter Tamara and son Darian, who, as a result of their love and devotion have given up so much to support me through this journey.

Also, to my parents, Robert and Patricia Roloff, who, have always believed and supported me in so many ways, to help me reach my goals.

Abstract

The Canadian health care system has been criticized for long wait times for specialized medical consults and procedures. The hypothesis tested in this investigator-initiated, MSDIF-funded program was that the combination of a single point of entry and prospective, proactive, algorithm-based case management by a multidisciplinary team would substantially shorten waiting lists for outpatient cardiology consultation. Retrospectively, a random sample of 69 patients referred to individual cardiologists at a large medical centre between March 15 - June 11, 2003 was compared with a random sample of 69 patients referred to the Cardiac EASE clinic between March 15 - June 11, 2004. Referrals were triaged by NP's who ordered diagnostic testing to be completed prior to the initial consult visit where NP's and PharmD's worked collaboratively with cardiologists to decrease wait times to 22 days (p=<.0001). Females had the shortest wait time (p=0.0229). No other variables affected wait time. A multidisciplinary outpatient clinic can effectively shorten wait times for cardiology consultations.

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The Effect of a Multidisciplinary Outpatient Clinic on Wait Times for Cardiology Consult

CHAPTER ONE

Introduction

Canada has a publicly funded health care system, which promises health care to all insured citizens (Health Canada, 1984). Since the 1990's there have been many criticisms of the heath care system and many concerns have been raised. Wait times for certain medical consults and procedures have been at the forefront of these concerns and it has been suggested that this is a factor that may compromise the delivery of high quality health care (Davies, 1999). Many groups have focused on decreasing wait times to ensure that Canadians have an efficient and effective health care system. However, many factions, including Alberta's Klein government, have questioned whether adequate access can be provided within Canada's Universal Health Care system. This has lead to calls for an ill-defined "third way" of delivering health care.

Cardiovascular disease (heart attack, stroke, heart failure, hypertension) is the leading cause of death amongst adult Canadians (male and female)(Heart and Stroke Foundation of Canada, 2006). Within cardiovascular medicine, the focus on improving access to care has been on wait times/lists for cardiac procedures, such as coronary artery bypass surgery (Kee *et al.*, 1997; Levy *et al.*, 2005) and coronary angiography (Higginson *et al.*, 1992; Natarajan *et al.*, 2002), rather than contact with a

cardiologist. This "tip of the iceberg" approach ignores the fact that obtaining a cardiac consult is the usual point of entry into the cardiovascular health care system and proceeds patients being placed on a procedural waitlist (Massel, 1999). Since most cardiologists, even those in a group, maintain their own waiting lists and lack the resources for prospective patient contact and testing, it is possible that the period of waiting is not based on a validated risk stratification model. This lack of triage may place patients at risk for adverse events while they wait. The lack of active planning for their visit also means they often arrive at the consultation without the required diagnostic testing to ensure that this long-awaited visit is efficient. Thus, it is important that cardiac consults be provided in a timely manner. At this point in time minimum investigation has been done in accessing cardiology consults (Western Canada Waiting List Project, 2005).

The information that is available indicates that a patient can sometimes wait several months for a cardiac consult (Bergstrom, 2004). A historical review for the Cardiology Division at the University of Alberta Hospital (UAH) indicates the average waiting time to obtain a cardiology consult was 2.5 - 4 months with no triaging system and no common waiting list but rather each cardiologist having their own wait list that was managed by themselves and their secretaries. This is in contrast to the efficient team that was developed to manage the common waiting list for patients waiting for CABG at the UAH.

The waiting time can be very worrisome for patients as a diagnosis isn't made and treatment is subsequently delayed. Moreover, little is known

about the event rate during the waiting period nor is it clear what types of diagnoses these outpatients ultimately present with. With this background, we proposed that a more systematic and innovative approach to accessing cardiac consultative services could reduce wait times, within the constraints of the Canada Health Act.

One such initiative was the development of a multidisciplinary general cardiac clinic staffed by nurse practitioners (NP) and a doctor of pharmacy (PharmD) who work collaboratively with the cardiologists to assist with decreasing wait times and improving the cardiac consultative process. In 2003 the Cardiac EASE clinic was established at the University of Alberta, a large quaternary care, Western Canadian University hospital. The goal of the Cardiac EASE clinic was to see patients within 4 -6 weeks of referral, NP's and PharmD's work in collaboration with the cardiologist's to see patients in a timely and efficient manner. Referring physicians are offered the choice of conventional consultation (in which they refer to a specific cardiologist) or referral to Cardiac EASE (in which case any of the EASE faculty may see their patient). Cardiac consult referrals that are sent to EASE come through a single entry point (a telephone or fax number within the clinic). The NPs then triage the patients based both on the written consult from the referring physician and by directly contacting the patient for supplemental information. The NP triages the access to the EASE cardiologist based on developed algorithms that assist with ordering the required diagnostic testing prior to the initial consultant visit. This is an essential step as it enables a provisional

diagnosis to be made prior to the first clinic visit and thus guides the pre-visit testing. The NP and PharmD complete histories and physicals at the initial visit reviewing the patients and making final plans with the cardiologist.

Purpose of Study

The purpose of the study was to determine whether a multidisciplinary, single point of entry clinic with an important NP role in patient triage and management prior to consultation would shorten wait times for cardiology consultation in a Academic group practice at a quaternary care medical centre

Research Question

The study was guided by the following research question: Does utilization of a multidisciplinary general outpatient cardiology clinic have an effect on wait times to obtain an initial cardiac consult?

Significance of Study

Extended wait times to obtain an initial consult with a cardiologist can be detrimental to a patient's physical and mental health. It is possible that adding the roles of NPs and clinical PharmDs to a multidisciplinary outpatient cardiology clinic might result in greater efficiency. Utilizing NPs and PharmDs has several potential advantages. It could result in reassurance for the patient that waiting is safe and provide them with a contact should their health deteriorate. Improved pre-consult testing, could also lead to more expeditious diagnosis and shorten time to definitive treatment of their cardiac aliment. If it is possible for patients to obtain a cardiac consult in a shorter period of time

then the health of the patient is likely to improve. It is also crucial to determine whether changing how we expend health care dollars within the guidelines of the Canada Health Act can accomplish the promised benefits of a "fee for service, private clinic" model.

Example of the EASE approach versus conventional consultation follows:

Conventional consultation process: Referral to individual cardiologist, secretary receives referral (may gather additional information), gives information to Cardiologist who returns referral, time frame is indicated for when to schedule appointment (limited diagnostic testing may be ordered), clinic appointment occurs, diagnostic testing is completed, probable follow up appointment to inform patient of diagnosis and initiate treatment. The referral time from receipt of referral to final or provisional diagnosis and treatment is estimated to be 3 months or longer. See Appendix J for Traditional flow chart.

EASE Approach: Referral to EASE, central intake to secretaries, triaging of referral by NP, diagnostic testing completed, clinic appointment with diagnosis and treatment, possible follow up tests and appointments scheduled. The referral time from receipt of referral to final or provisional diagnosis and treatment is estimated to be 4 – 6 weeks. See Appendix K for EASE flow chart.

Note that the EASE approach involves one visit (in most cases) to obtain a provisional or final diagnosis and because the cardiologist is not prespecified patients are assigned to the cardiologist with the shortest waiting

time. The consulting cardiologist can also be changed to another if necessary. For example, if the patient's condition changes requiring an earlier appointment, the date is not determined by a specific physician's availability. The early NP contact allows symptom-specific testing prior to the initial clinic visit to enable a provisional or final diagnosis and the initiation of treatment at the first visit.

CHAPTER TWO

Literature Review

The English language literature regarding health care wait times was reviewed using CINAHL (Cumulative index to nursing and allied health literature) 1982 – December 2005 and Medline 1966 – January 2007. In addition to a broad search (using the terms "waiting times, waiting lists, Canada, cardiac surgical procedures, cardiovascular diseases, cardiology service, hospital, comparative study, cross cultural comparison") we specifically searched for literature dealing with access to cardiac diagnostic testing and consultation. There were very few scientific studies found relating to wait times.

Literature related to the role of NPs in autonomous or collaborative consultative practice was assessed, with a focus on cardiology (including description, abilities and various roles in cardiology).

A similar literature review was conducted examining the role of the PharmD but again was limited. In 1990 The American Council on Pharmaceutical Education (ACPE)(Hill, 1999) mandated the new first professional degree to be a Doctorate in Pharmacy. This took effect in the USA starting in the year 2000. Data is scarce or isn't specific to Doctor of Pharmacy, the terms clinical pharmacists/pharmacotherapy are frequently used. Specifically searching for information on the PharmD roles within Canada yielded no results therefore data pertinent to pharmacists in specialized clinical settings was used. This

thesis does not include a comprehensive assessment of the contribution (real or potential) of PharmD's to this process.

It is useful to review the health care environment in Canada, to identify why the assessment/implementation of the Cardiac EASE clinic is particularly timely.

The Canadian Health Care System

The Canadian Health Care system was founded on the philosophy that universal health care should be available for all insured Canadians (Health Canada, 1984). It is a publicly funded system allowing Canadians access to health care on an equal basis. The general principle of the Act is that health care is funded by the Government (Federal and Provincial) to all Canadians for all medically necessary health services. It is mandated to be universal, portable and accessible.

Specifically the Canada Health Act states the primary objective is .... "to protect, promote and restore the physical and mental well-being of residents of Canada and to facilitate reasonable access to health services without financial or other barriers"(Health Canada, 1984). The system however is challenged to meet expectations for delivering timely high quality health care with studies and public opinion poles showing rural and urban Canadians are losing faith in this system for health care delivery (Romanow, 2002). In addition, health care funding is increasingly a provincial responsibility, with proportionately fewer federal dollars and thus weakened Federal influence.

The Government of Canada has acknowledged the concerns of Canadians. During the First Ministers conference in 2002, where all the Premiers of the Canadian Provinces and Territories met and discussed issues such as health care, it was determined that decreasing wait times for access to medical care and procedures needed to be given high priority(Western Canada Waiting List Project, 2005). The 2002 Romanow report confirmed that Canadians expect decreased wait times for access to specialists, medical treatments and diagnostic testing (Romanow, 2002). The Romanow report proved to be a credible, national voice of Canadians that was able to highlight the importance of decreasing wait times/lists and providing accessible safe and high quality health care.

Health Law and Waiting Times

There has been one key ruling by the Canadian Supreme Court relating to wait times for health care. The ruling indicated that preventing patients from seeking private health insurance violated the Quebec Charter of Rights(Supreme Court of Canada, 2005). A physician and his patient argued, that his patient had waited to long on the public system wait list for hip surgery, and should have the right to pay for private insurance for this medically necessary procedure thus allowing the procedure to occur sooner. The ruling was not considered to violate the Canadian Charter of Rights and Freedoms but also did not have an impact on the health care system outside of Quebec. However, while this case was specific to Quebec, it suggested that changes needed to occur with how health care is delivered in Canada.

Specifically, the need to decrease wait times for procedures and specialty consults(Western Canada Waiting List Project, 2005). Such rulings raise the specter that law may mandate access to private health care if the government-funded system fails to reform itself within a reasonable time frame. This provides yet another rational to test alternative methods and to use alternative ways of providing consultative cardiology services in Canada.

Wait time

Wait Time in General

Long wait times have developed for certain medical subspecialty consults and procedures, as supply and demand for services hasn't been met. Long wait times have consequences for patients and these include personal, financial and work-related stress as well as increased morbidity and mortality(Western Canada Waiting List Project, 2001).

Discussions about wait times began in 1989 after Health Canada released its first national report on waiting times in Canada (Sanmartin, 2003). Initially there was no standardization with regards to how wait times were calculated and tracked (Milne, 2002). Some researchers suggest that wait time begins the moment the patient enters the health care system with their initial complaint and continues until they have final treatment for their symptom(Western Canada Waiting List Project, 2005). Others indicate that wait times starts when the patient is seen by a specialist and continues until they have received specialty treatment or they are put on a wait list for a specific procedure (Sanmartin, 2003). It is our view that waiting times for

cardiology consultation begins once the patient's GP places a request for consultation.

Wait times and wait lists are often used interchangeably. However, wait lists typically refer to the number of patients on a waiting list for a specific procedure or a specialty consult and this information is not as informative or reliable as monitoring wait times (Shortt, 2000). Various factors influence the length of a wait list and the number of weeks it takes to actually have all patients on the list seen. So, it is more effective to discuss the expected length of time on a wait list rather than the number of patients on the list since simply identifying where someone is on a wait list doesn't give the patient any idea when the necessary consult or subsequent procedure will be done.

Cardiac Wait Time

One of the most commonly documented and politically charged wait times is for coronary artery bypass grafting (CABG). Excessive wait times can have an adverse impact and can even result in death (Hadorn, 2000). Therefore cues affecting times frames for coronary artery bypass surgery have been identified (Kee et al., 1997). Countries that have focused on wait lists/time for cardiac surgery internationally include Sweden (Ridderstolpe *et al.*, 2003), New Zealand(Seddon *et al.*, 1999), and Belfast (Kee et al., 1997). Within Canada, British Columbia (Sobolev *et al.*, 2005), Ontario (Alter, 2005) and Alberta (Higginson et al., 1992) have published data relating to the monitoring wait times. After approximately 10 years of investigating this issue it has been determined managed wait lists, and a cardiac urgency

scoring systems (e.g. Ontario scoring system) which identifies clinical priority issues (e.g. LV dysfunction) that are essential to ensuring the patients with the greatest need and/or greatest potential benefit receive their surgery first (Seddon et al., 1999). However, there is still work to be completed to determine actual time frames and to perfect the scoring systems.

The Organization for Economic Co-operation and Development (OECD) completed a comparison of 12 OECD countries, their methods of dealing with wait times for elective surgery and studies completed (Organization for Economic Co-operation and Development, 2003). All countries selected areas that they felt were high priorities, with the majority including initiatives to deal with access to cardiac surgery in same way or another. The OECD compiled together for each country the types of health care system, funding, surgical priority areas and strategies utilized to deal with wait times. Reviewing the data complied, all countries failed to acknowledge improving access to obtain a cardiac consult is an essential component required prior to being placed on a wait list for CABG.

Natarajan (2002) described wait times for cardiac catheterization and the associated adverse events that can occur during the waiting time for the procedure. For a 2-year period ending March 31, 2000 all patients referred for cardiac catheterization at a regional center in Hamilton, Ontario, where tracked to document wait time and adverse events. This included 4725 inpatients and 3305 outpatients. Half of the adverse events occurred within 35 days of referral for outpatients and included myocardial infarction,

congestive heart failure and in some cases death. Although this differs from the wait for outpatient cardiology consultation it does provide an excellent example that morbidity and mortality occurs in cardiovascular disease patients while they await procedures and likely by extrapolation while they await consultation.

A review of the literature indicates that wait times to obtain a cardiac consult haven't been examined as closely and we could find no scientific studies reviewing the appropriate time frame for completion of a cardiac consult. The lack of data was supported by several authors(Bergstrom, 2004; Knudtson *et al.*, 2006; Massel, 1999; Merritt, 2004; Wait Time Alliance for Timely Access to Health Care, 2005). Therefore the data that is available and reviewed in this document is related to benchmarking, opinions of government agencies and medical experts. This is the first step towards determining what appropriate wait times should be.

Wait times within Canada

With the implementation of the Cardiac Care Network (CCN), Ontario was the first province to track wait times for cardiac care (Organization for Economic Co-operation and Development, 2003). This initiative was started in 1990 to ensure timely access to cardiac surgery for patients based on the calculated urgency for the patient requiring the surgery (Shortt, 2000). A group of Ontario hospitals worked together to ensure that patients were prioritized correctly and sent to the corresponding institution where procedures could be done expediently. This was the first acknowledgement

of meeting supply and demand of all patients in a specified area and to ensure best utilization of available resources.

Governmental Initiatives To Shorten Wait lists

In September 2004, at the Canadian First Ministers Conference, one of the major commitments of the attendees was to achieve meaningful reduction in wait times by March 31, 2007 in five priority areas including cardiovascular disease (Association of Canadian Academic Healthcare Organizations, 2005). This prompted many provinces and health care organizations to develop strategies to fulfill this commitment.

The Wait Time Alliance Team was created after the 2004 First Minister's Conference (Wait Time Alliance for Timely Access to Health Care, 2005) to focus on the priority areas that were identified. The Alliance includes members from the Canadian Associations of Nuclear Medicine, Radiation Oncologists, Radiologists, Canadian Cardiovascular Society, Medical Association, Ophthalmologic Society and the Orthopaedic Association. The aim of the team was to develop benchmarks and best practice standards for wait time management (It's about Time, 2005) for 6 priority areas including cardiac care, nuclear medicine, radiology, joint replacement, cancer care and sight restoration.

Cardiac Care included; access to cardiac consultations, diagnostic procedures (e.g. diagnostic catheterization), therapeutic services and procedures (e.g. cardiac surgeries and electrophysiology services) and; cardiac rehabilitation. Wait time benchmarks were classified into three

clinically relevant levels of urgency: emergency cases, urgent cases and scheduled cases.

Benchmarks for obtaining cardiac consults were determined as follows. First, initial cardiac consults for emergency cases should occur as soon as possible and definitely within 24 hours. Second, urgent cases requiring a cardiac consult should be seen within 7 days and scheduled cases seen within 6 weeks. Third, wait times for Cardiac Nuclear Imagining for emergency cases should be completed immediately but no later than 24 hours. Finally urgent nuclear imagining cases should have testing completed within 3 days and scheduled testing within 14 days(Wait Time Alliance for Timely Access to Health Care, 2005). Having several specialties work together produces many benefits such as including nuclear imagining wait times as a priority area. Access to perfusion or viability testing is often an essential step to definite treatment for cardiac ailments. While the Alliance is only providing benchmarks, they are thinking broad scope as to all possible factors affecting the priority areas to achieve appropriate wait times.

The Western Canadian Wait List Project (2005) was comprised of all provinces in Canada west of and including Manitoba. It was organized with a focus of developing maximum acceptable waiting times for 5 target areas; cataract surgery, general surgery hip and knee replacements, MRI and children's mental health services (Western Canada Waiting List Project, 2005). They previously developed wait list priority criteria scoring tools for these areas to assist with managing wait lists. Unfortunately cardiac services

were not included in these priorities however the final observations the Project made can be utilized to assist those determining wait times for cardiac consultations. These recommendations include: implementation and evaluation of priority setting tools, formulation of maximum acceptable waiting times and tool development for referral to specialists. Formulation of maximum acceptable wait times has been benchmarked by the Alliance group but no work on the other two areas has been identified.

Several criticisms of these benchmarks and other working groups recommendations for when cardiac consults should be completed have been identified. One of the most common criticisms is that benchmarks reflect expert opinion and are not the outcome of a transparent, reproducible methodology (Schaafsma, 2006). In addition there have not been reproducible studies that recommend the exact time frame within which a cardiac consult should be optimally completed.

While there has not been any scientific studies completed, several surveys have been undertaken to measure the actual wait times for a cardiac consult (Bergstrom, 2004; Capital Region Medical Staff Association, 2000; Massel, 1999; Merritt, 2004).

Wait Time Surveys

Local Wait Time Survey

The Capital Region Medical Staff Association (CRMSA) represents all physicians working in the Edmonton and surrounding area in Alberta (Health Region 6). The Association completes a physician's access survey yearly to

identify problems with timely patient access to consultations from specialists, investigations (CT, MRI) and surgical procedures(Capital Region Medical Staff Association, 2000). The 2000 survey was sent to 1312 physicians; 640 family physicians (48.8% responded), 499 medical specialist (47.5% responded) and 163 surgical specialists (56.4% responded). Wait times were reported by the cardiologist and by the family physician that initiated the referral. Average non-urgent wait times to see a cardiologist was 90 days as reported by the referring physician and 91 days as reported by the cardiologist. Family physicians reported wait times were 14.1 days wait time for urgent patients, while cardiologists reported 8.4 days for the same patient.

The survey conducted in 2004 had 1652 physicians who responded. 41.6% of family physicians, 57.2 surgical specialists and 41.9 % of non surgical specialists contacted responded. While only approximately 50% from each group of physicians responded, the response rate is similar between the survey in 2000 and 2004. This survey found mean non urgent wait times decreased to 74 days (family physicians) and 57.2 days (cardiologists) respectively (Bergstrom, 2004). Urgent wait times were not documented in 2004. While these are only surveys and therefore have their limitations (i.e. only 50% in each subgroup responded and they are opinion not actual documented wait times) it is reassuring wait times do appear to have decreased. This may be related to attempts to decrease wait times in the last several years but again this is only speculation.

American Wait Time Survey

A telephone survey completed in 2004 by a national physician search and consulting firm (Merritt, Hawkins & Associates) focused on 4 medical specialties: Cardiology, Dermatology, Obstetrics-Gynecology, Orthopedic Surgery. They conducted 2,500 phone calls but ultimately only 1,062 surveys were completed. Specifically for Cardiology they contacted between 15 and 20 individual cardiology offices within 15 major metropolitan areas in the United States of America (USA) to see what the average wait time would be for a "heart check up" (Merritt, 2004). One limitation to the survey was that the cardiologist's hospital affiliation was not identified and another is that while they acknowledged there were 278 completed surveys, the total number of actual telephone attempts is not known. The firm does state they tried to get 20 responses per city therefore through speculation those cities with less than 20 responses would have had some non responders. The cities that had 15 – 19 responders include: Boston, Miami, Detroit, San Diego, Los Angeles, Washington, D.C., Dallas and Seattle compared to the cites that had 20 responders which included: Philadelphia, Portland, Denver, New York, Atlanta, Minneapolis and Houston.

The survey found the average wait time to see a cardiologist was 18.8 days (Detroit, San Diego, Atlanta and Miami), the shortest average wait time 3.0 days (New York, Miami and Atlanta) and the longest average wait time was 65.8 days (San Diego). The absolute shortest wait time was 1 day (Philadelphia, Los Angeles and Seattle) and there were 5 responses that

were outliers for wait times: Minneapolis 105 days, Boston 120 days, Portland and Denver with 128 days and Philadelphia 136 days. Only 50% of the cardiologist accepted Medicaid which is the USA's health care program for person's who can't or don't have private health insurance. Whether or not Medicaid was accepted didn't necessarily have an effect on wait times. In New York, Dallas and Seattle where no cardiologist's accepted Medicaid the average wait time was 22, 10 & 9 days respectively. However, Portland and Washington, DC, where 100% of cardiologist's accepted Medicaid the wait times were 25 and 12 days respectively (Merritt, 2004). This variance in wait times is very interesting since Canada is a publicly funded health care system trying to achieve the same benefits supposedly found in the privately funded American system. The Canadian success's when compared to the American system, calls into question the effectiveness of the private system.

Cost of Wait Lists to Patients

As eluded to earlier there are many health related issues that patients have to deal with while waiting for health care. These can include issues to their physical and/or mental well being. While there is no specific literature on complications patients may experience while waiting for a cardiac consultation there have been investigations for risks patients experience while waiting for CABG, cardiac catheterization and other surgeries.

The risks associated with waiting too long for CABG have the most investigations completed as the patients can experience severe events such as death. Sobolev et al recently completed a population–based prospective

study of 8,325 patients who were wait listed to have CABG during the years 1990 - 2001 at four tertiary care hospitals in British Columbia. The ultimate goal was to provide a better estimate of the risk of death associated with delaying CABG. The patients were categorized into 2 separate groups essentially into an urgent group and a lower priority group. The records were analyzed for the date of the planned surgery or the reason for removal off the surgical wait list. It was determined 80 (1%) patients died while awaiting surgery, this included: 54 (.8%) patients from the urgent group and 26 (1.4%) from the less severe group(Sobolev *et al.*, 2006). Thus even though patients are prioritized for urgency of surgery, a patient's risk of dying can change while on the wait list. This included even those patients who were placed on the list as low urgency; they also do not remain static. This emphasizes the importance of managed wait lists but also illustrates the additional need to decrease wait times to decrease morbidity and mortality.

Other impacts to patients lives while waiting for surgery include: deterioration of their quality of life, unable to continue working at their job, negative impact on financial situations, increased cost of the total treatment, increased anxiety and stress(De Jong-Watt & Arthur, 2004; Organization for Economic Co-operation and Development, 2003; Teo *et al.*, 1998). While these issues do not affect mortality and morbidity they do have a destructive force in the quality of the lives the patients are experiencing while on a waiting list. Depending on the length of the wait list, some of these effects may not be reversible once the procedure is finally completed.

Nurse Practitioner

A NP as defined by the Canadian Nurses Association (CNA) is a registered nurse (RN) with additional education in health assessment, diagnosis (including ordering tests) and management (prescribing drugs) of illnesses and injuries(Canadian Institute for Health Information & Canadian Nurses Association, 2005). Nurse practitioners have been present for the last 25 years in Canada. The first NP program for nurses was implemented in 1967 at Dalhousie University in Nova Scotia (Patterson et al., 1999). Initially the programs were targeted for nurses working in northern communities where it was difficult to attract physicians. The progress of the roles has been very unpredictable with many advances intermingled with diminished roles during the 1980's. However, in 1984 the Canada Health Act was passed which allowed for health care professionals other than MD's to provide direct access to the health care system (Mousseau, 1999). During the late 1980's there was also increase emphasis on high quality, cost effective health care and the concept of health promotion was introduced.

These developments as well as physician shortages and expanded scope of practice for nurses supported the revitalization of the role of the NP. During the 1990's, new NP education programs arose, which promoted NP roles within Primary Health Care but also supported NP's working in acute care in large teaching hospitals(Nurse Practitioners Association of Ontario, 2006). NP's today are working in acute care areas such as; emergency departments (Kleinpell-Nowell, 1999), cardiac surgery (Meyer & Miers, 2005),

and intensive care units (Hoffman *et al.*, 2003). Specifically within the field of cardiology NP's work in the following specialized clinics, secondary prevention (Frenn, 2003; Woodend, 1999), anticoagulation (Connor *et al.*, 2002), congestive heart failure (Stromberg *et al.*, 2003), chest pain (Pottle, 2005). Some NP's even complete simple cardiac catheterization (Boulton *et al.*, 1997).

Utilizing NP's within various roles has been shown to decrease coronary events through secondary prevention (Campbell *et al.*, 1998; Murchie *et al.*, 2003), improve survival and quality of life, decrease admissions to hospital, and hospitalized length of stay (Ducharme *et al.*, 2005; Gustafsson & Arnold, 2004; Stromberg & Dahlstrom, 2004; Stromberg et al., 2003). Additional benefits attributed to NP's include cost savings and improving the efficiency of the health care system (Meyer & Miers, 2005; Raftery *et al.*, 2005; Stewart *et al.*, 2002).

Doctor of Pharmacy (PharmD)

The PharmD role is fairly new to the Canadian health care system with the first Canadian PharmD program initiated in 1991(University of British Columbia Department of Pharmacy, 2006). The development of the PharmD role has evolved with the profession of pharmacy. Pharmacy has "shifted its focus from drug products to a focus on clinical roles at the bedside and delivery of pharmaceutical care"(Canadian Society of Hospital Pharmacists, 2005). Collaborative drug therapy monitoring by pharmacists was initiated in 1997. This permitted pharmacists to expand their role and work together

with physicians to tailor therapeutic plans for improved patient care (American College of Clinical Pharmacy, 2000).

With the current changes that are occurring within the health care system, clinical pharmacotherapy has been identified as a method to provide effective and efficient drug therapy outcomes. PharmD's have advanced education that qualifies them to design, implement, monitor, evaluate and modify patient pharmacotherapy to ensure effective, safe and economical patient care(American College of Clinical Pharmacy, 2000). They are educated in health assessment, management of illness and diagnostic testing (Rothman & Weinberger, 2002). Currently Canadian legislation is proceeding to enable pharmacists to obtain prescriptive authority(Alberta Pharmacists Association, 2006). The PharmD is well equipped to collaborate with other health care members and provide cost savings to the health care system (Schumock *et al.*, 2003).

Traditionally PharmD's are present within large tertiary care hospitals usually within specialty clinics but by 2003 PharmD's were also involved in community practice (Hammond *et al.*, 2003) . A few different roles that have been established are; anticoagulation management (Breault, 2006; Chamberlain *et al.*, 2001), heart failure (Gattis *et al.*, 1999; Koshman, 2006), cholesterol management (Bozovich *et al.*, 2000), hypertension control (Mehos *et al.*, 2000), diabetes mellitus (Hammond *et al.*, 2003) and oncology (Timberlake, 2002).

Pharmacists have been shown to provide cost savings but have also been shown to decrease number of deaths when involved with managing drug therapy (Hammond *et al.*, 2003). Other benefits attributed to the role of the PharmD is to provide improved morbidity and mortality in patients with heart failure (Gattis et al., 1999), decreased admissions to hospital for heart failure(Koshman, 2006), improved management of anticoagulation targets (Chamberlain et al., 2001) and therefore decreasing the number of hemorrhagic events (Bungard, 2006).

Comparison of Referral Methods

Historical Method for Cardiac Consultations/Referrals

Traditionally when a referral was made to a cardiologist at the University of Alberta Hospital, a large Canadian University Hospital, there was no central intake system. Referrals were sent to individual cardiologists and non-medical personnel managed the wait lists. Wait times were approximately 3 – 4 months long. The only method to deal with referrals when a physician was away for extended periods was to suggest referral to another physician. Urgent referrals generally were identified when the referring physician contacted the Cardiologist directly. Diagnostic testing was not typically ordered until the first consult session, which can lead to further delays for diagnosis and treatment.

Development of the Cardiac EASE Clinic

Cardiac EASE was created with a $1,000,000 grant applied for by Dr. S.L. Archer and Dr. T.J. Bungard from the Medical Services Delivery and

Innovation Fund. The grant monies were utilized to fund 3 years of operational costs of the Cardiac EASE clinic. The cardiologists at the University of Alberta Hospital are paid through the Alternate Funding Plan that guarantees them a set monthly wage and is not driven by billing for specific services completed. This results in the same fee to the health care system whether a cardiologists sees 4 or 8 patients.

The team included Dr. S. L. Archer, Dr. L.D. Lalonde (Medical Director), other cardiologists (4 dedicated to weekly clinics; 3 cover 1 or 2 clinics per month and several others willing to help as required), 2 NP's fulltime, 2 PharmD's sharing a half time role, half time echocardiography technician and electrocardiography technician and 2 full time secretaries. The EASE clinic is located in 2 areas at the University of Alberta Hospital: the clinic space (3 clinical examination rooms) is located in the division of Cardiology and the office space is located in a nearby area.

Initially the idea of utilizing NP's and PharmD's in the referral process was threatening to many physicians. Many cardiology divisional meetings were held to deal with these concerns (e.g. liability, reporting structure). Ultimately all issues were dealt with, the clinic was initiated and there is now increased interest from the initial opposing cardiologists to work in the clinic.

Specifics/Methods of Cardiac EASE

The Cardiac EASE clinic was initiated in July 1, 2003. Referrals to the clinic can be from general practitioners, NP's and other medical specialists.

The referrals are sent to a single point of entry (a fax number) and then triaged.

The nurse practitioner is responsible for triaging the patient referral i.e. identifying from the chief complaint the urgency of the referral (which may also include speaking with the patient directly for further clarification). The time frame to see a patient can be categorized; urgent requiring consult within 7 – 10 days, average requiring a consult within 4 -6 weeks; or non-urgent requiring a consult in the next 3 -6 months. Determining and ordering specific diagnostic testing to be completed by the patient prior to the initial clinic visit is also a function of the NP. Algorithms were developed based on the American College of Cardiology (ACC)/American Heart Association (AHA) Guidelines for management of specific clinical conditions and as well as several key cardiologists at the University of Alberta Hospital previous clinical experience and expertise. These algorithms assist the NP with triaging the patient and arranging for appropriate diagnostic testing. The algorithms include, Chest Pain (Appendix B), Shortness of Breath (SOB)/Congestive Heart failure (CHF)(Appendix C), Palpitations/Syncope (Appendix D), Valve Disease/Murmur (Appendix E) and Atrial Fibrillation (Appendix F). If necessary cardiologists dedicated to the clinic are available for the NP to review complicated cases to ensure appropriate decisions are made. Having diagnostic testing available at the first clinic visit is extremely beneficial because a working or final diagnosis can then be made during that visit.

Patients are scheduled into clinic following the completion of their diagnostic testing. The daily timing of appointments are based on enhancing efficiency for all. Patients are scheduled to result in the cardiologist completing one consultation (including dictation) and aligning with the next patient being ready to be reviewed with the NP or PharmD. This process allows cardiologists to see more new cardiology consult patients in one clinic setting than traditionally possible. The anticipated benefit is for an increased number of new cardiology consults to be seen per year.

Besides triaging patient referrals the nurse practitioner also completes the history and physical at the consult visit, reviews results with the cardiologist, and accompanies the cardiologist while the final diagnosis and plans are determined. The PharmD within the Cardiac EASE clinic also completes this integral role during the initial visit. The cardiologist completes the dictation for the referring physician while the NP and PharmD finalizes patient teaching with regard to medications and primary or secondary prevention of heart disease as appropriate. If a patient requires follow up diagnostic testing after the initial consultation, the NP reviews the results to determine if further follow up is required by the cardiologist and informs the patient. If results indicate no coronary artery disease the NP completes all follow up including primary prevention counseling.

Currently the role of the PharmD is limited to the initial consult visit with the patient, however it is anticipated as the clinic grows the role will be involved in all the same aspects of the clinic as the NP role.

CHAPTER THREE

Method

Design

A comparative descriptive design using retrospective data analysis was used to determine if utilizing the skills of a NP and PharmD in a general outpatient cardiac clinic could decrease the wait times to see a cardiologist.

Sample

For 3 months (March 15, 2003 to June 11, 2003) the secretaries of individual cardiologists tracked all referrals (n=404) to the Cardiology division at the University of Alberta Hospital. From this number every 5th patient was chosen to comprise the random sample (n=69) for the PreEASE group. Referrals to the Heart Function or Risk Reduction Clinic's were not included. Information related to date referral was received and the date of the scheduled cardiac consult was documented. This was monitored weekly to ensure completeness. If diagnostic testing was ordered prior to the clinic date it was also documented. This data was then entered into a database specially developed for the Cardiac EASE clinic.

The cardiac EASE clinic was initiated in July 2003 and from then until January 2004 it was considered to be in the initial operational phase. In order to reduce extraneous variables the same time frame for the PreEASE sample of patients was utilized for the EASE sample of patients. All patients (n=182) who were referred to the Cardiac EASE clinic between March 15, 2004 and June 11, 2004 were initially chosen to form the Cardiac EASE clinic wait time

comparison group. In order to create equivocal sample groups a random sample of roughly every 3rd patient was selected to form the EASE group (n=69). All patients were informed on first contact to the clinic that it was a research clinic trying to improve access and efficiency. All patients were given written consents to complete (Appendix A). The consent was reviewed with participants by either the NP or PharmD to ensure that informed consent was obtained. For the purposes of this study all patients who signed the consent were included in the data collection. Information related to the date the referral and the date of the scheduled cardiac consult was documented. This was monitored weekly to ensure completeness. If diagnostic testing was ordered prior to the clinic date, it was also documented.

Data collection

A database was developed specifically for the Cardiac EASE clinic. This allowed for the specific required information to be collected and tabulated. Access to the database was limited to those specifically involved in the Cardiac EASE clinic. Data entry to the database was limited to ensure reliability of the data being entered. In addition training was provided to ensure an understanding about what data required entry. Collected data included: date of referral, date of initial cardiac consult, dates of testing required for the cardiac consult (pre clinic visit or after clinic) and referral reason. Personal demographics including name, age, sex, and address including postal code to tabulate residing health region of the patient were collected. The database was utilized as a place to document any contact with

the patient with regards to appointments and contact information. This same data was available for the pre EASE population. Wait time was calculated as the date the referral was first received by the EASE clinic to the date of the initial cardiac consult.

Data Analysis

Statistical Package for Social Sciences (SPSS) v.14 was used for data entry and analysis. Descriptive statistics (mean, median and mode) were used to summarize data and were chosen based on the level of measurement of the particular study variables used. Independent t-tests were used to determine differences in wait times and age between the two groups. Chi Square tests were completed to determine if there was a difference between the PreEASE and EASE groups with respect to gender and referral reason. Fisher's exact test was completed to determine if there was a relationship between the PreEASE and EASE groups with respect to the Health Region residence. Finally, ANOVA was utilized to determine the relationship between demographic variables and wait times as well as to determine differences in wait times based on those patients seen by the multidisciplinary clinic or by cardiologists.

Ethical considerations

Ethical approval for this research study was obtained from the Health Ethics Review Board, Capital Health Region (Appendix M). All patients attending the Cardiac EASE clinic had the written consent (Appendix A) verbally reviewed with them and then were asked to sign it once clarification

was received. This provided reassurance that the patient understood the information and had the opportunity to ask any questions. All patients were made aware that signing the consent was voluntary and not signing the consent would have no consequences to their care within the Cardiac EASE clinic. There was no harm or ill will that could occur to the patient, as all information was anonymous and confidential. The written documentation was kept separately in a locked filing cabinet within the Cardiac EASE office. Data tabulated for analysis was anonymous as only dates for referral and appointments were utilized with no identifying information. This information was placed into the Cardiac EASE database. Access to the database was limited to individuals directly involved in patient care at the Cardiac EASE clinic.

CHAPTER FOUR

Findings

The purpose of this study was to determine whether a multidisciplinary single point of entry clinic would decrease wait times for cardiology consultation. The research question guiding this study was to determine if utilization of a multidisciplinary general outpatient cardiology clinic would have an effect on wait times to obtain an initial cardiac consult.

Participant Characteristics

There were 69 patients in the PreEASE sample including 28 females and 41 males. The sample ranged in age from 17-86 years with a mean age of 59.9 years. These patients represent a random sample of patients referred to the Division of Cardiology in the traditional manner between March 15, 2003 and June 11, 2003. There were also 69 patients in the EASE sample including 32 females and 37 males. The sample ranged in age from 23-90 years with a mean age of 59.8 years. These patients represent a random sample of patients referred to the Cardiac EASE clinic between March 15, 2004 and June 11, 2004.

A comparison of baseline characteristics of the participants randomly assigned to each group (PreEASE/EASE), using chi square or independent t test analysis, where appropriate, revealed that both groups were homogeneous with respect to age and gender. No statistically significant differences existed between the two groups on either of the variables (Table 1, 2 & 3).

Table 1

Patient Characteristics by Age

Age (yrs)	PreEASE n=69	EASE n=69	t	p value
Mean Age	59.9	59.8	0.04	0.5
Min Age	17.5	23.6		
Max Age	85.6	90.2		
Std D	16.0	15.6		

The groups were further categorized into 10 year age groupings (Table 2). The patient's age was rounded to the nearest age (e.g. if the average patient's age was 29.79 they were moved into the 30-39 grouping). Age was fairly evenly distributed between PreEASE and EASE groups. The minimum age category was 10-19 as the EASE clinic does see patients who are 17 years of age. If patient is younger than 17 years old and referred to EASE, their referral is sent to the pediatric cardiology clinic. There were a limited number of patients in the oldest age category of 90 – 99 years for both groups.

Table 2

Age Range Comparison

Age Range(yrs)	PreEASE N=69	EASE n=69
0-9	0	0
10-19	1	0
20-29	3	3
30-39	2	3
40-49	11	13
50-59	18	12
60-69	12	17
70-79	14	15
80-89	8	5
90-99	0	1

Typically the gender ratio for male vs. females for heart disease is about 70% males and 30% females. In the PreEASE group there were 59% males and 41% females. The EASE group was even more evenly represented with 54% males and 46% females.

Table 3

Patient Characteristic by Gender

Gender	PreEASE	EASE	Chi Square
Male	41	37	.61
Female	28	32	

Patient Referral Information

Initial Referral Reason

When patients are referred for a Cardiac Consultation they are classified according to their chief concern. Referral reasons initially comprised fourteen different categories. The two sample groups were homogeneous only in one category. The majority of patients from each group were referred for chest pain. (PreEASE= 32% and EASE= 44%). Other classifications of referral reasons for both groups were varied. In the PreEASE sample patients were primarily referred for coronary artery disease assessment and atrial fibrillation. There were no referrals for hypertension and congestive heart failure. In the EASE group patients were mainly referred for atrial fibrillation and palpitations. There were no patient referrals for arrhythmia or pre-operative assessment (Table 4).

Table 4

Initial Referral Reasons

Referral Reason	PreEASE N=69	EASE n=69
Abnormal ECG	3	1
Arrhythmia	2	0
Atrial Fibrillation/Flutter	7	12
CAD Assessment	11	1
Chest Pain	22	29
Other	6	1
Palpitations	6	7
Preoperative Consult	5	0
Presyncope	1	2
Shortness Of Breath	4	5
Syncope	1	1
Valvular Heart Disease	1	6
Hypertension	0	1
Congestive Heart Failure	0	3

Comparison of Referral Reason Groups

In order to further analyze the data, referral reasons were regrouped. The arrhythmia category includes the subcategories of palpitations, atrial fibrillation/flutter and abnormal ECG as well as referrals for arrhythmia. The "other" category includes coronary artery disease assessment and

hypertension as well as those originally referred for "other" (Table 5). Chi Square analysis on the new groupings indicated that chest pain was the most frequent reason for referral for both PreEASE (31%) and EASE (42%) groups, followed closely by arrhythmia (PreEASE – 18% and EASE – 20%). The groups continue to differ more on referral reasons in other categories. In the PreEASE sample 26% of patients were referred for the "other" category while for the EASE group, only 4% of the patients were referred to this category. The Ease sample group had no referrals for pre operative assessment, which contributes to there being a statistical difference for referral reason between groups.

Table 5

Comparison of Referral Reason Groups

Referral Reason	PreEASE N=69	EASE n=69	Chi Square All Referral Reason
Arrhythmia	18	20	0.0016
Chest pain	22	29	
CHF/SOB	4	8	
Pre Op	5	0	
Pre/Syncope/VHD	3	9	
Other	17	3	

Individual Referring Health Regions

In Alberta, the provincial government has divided up the province into Health Regions to provide health care to those citizens who reside in a particular geographical area. Health care in each region is provided through a Regional Health Authority (Appendix L). Patients were referred to the PreEASE group from all Health Regions in Alberta excluding the Calgary and Palliser Regions. The majority of referrals came from the Capital Health Region followed by East Central and David Thompson. There was one patient referred from outside of Canada and one patient from the province of Saskatchewan.

The PreEASE and EASE groups were fairly homogeneous in terms of health region distribution (Table 6). The majority of referrals for both groups came from the Capital Region which includes the city of Edmonton and surrounding areas. The David Thompson Region was the next largest area for referrals followed by East Central Region. For the EASE group, there was one patient referral from each of the following provinces: BC, Saskatchewan and the Yukon Territories.

Table 6

Individual Referring Health Regions

Referring Health Regions within Alberta	PreEASE N=69	EASE n=69
Region 2- Palliser	0	0
Region 3- Calgary	0	0
Region 4- David Thompson	7	16
Region 5- East Central	14	2
Region 6- Capital Health	42	42
Region 7- Aspen	1	4
Region 8- Peace Country	1	1
Region 9- Northern Lights	2	1
Referring Provinces outside Of Alberta		
British Columbia	0	1
Northwest Territories	0	0
Saskatchewan	1	1
Yukon Territories	0	1
Other	1	0

Comparison of Referring Health Region Groups

Health regions were then grouped to determine if there was any relationship between referral region and PreEASE/EASE group (Table 7). The new groupings were Southern Alberta, Central Alberta, Capital, Northern

Alberta and other. Southern Alberta included Health Regions 2 & 3, Central Alberta included Health Regions 4 & 5, Capital Region, and Northern Alberta included regions 7, 8 & 9. "Other" includes referrals from outside of Alberta mostly: BC, Yukon, NWT, Saskatchewan. Fisher's Exact test was completed as some of the regions had less than five referrals. The test indicated that there was no relationship between referring regions and PreEASE/EASE groups

Table 7

Comparison of Referring Health Region Groups

Referring Health Region Region	PreEASE n=69	EASE n=69	Fisher's Exact Test for all Regions
Southern Alberta	0	0	0.3420
Central Alberta	21	18	
Capital Region	42	42	
Northern Alberta	4	6	
Other	2	3	

Wait Time

Comparison of Wait Time by Sample Groups

While determining wait times it became evident that not all patient wait times can be attributed to the scheduling arrangements of either the Cardiologist's private clinic or the Cardiac EASE clinic. Categories have

therefore been created to describe this phenomenon. For both PreEASE and EASE groups the "referral to first booked appointment" category reflects the first appointment booked for the patient after the initial referral was received. Patients at times were not able to make the appointment due to their own issues (e.g. travel, personal scheduling conflicts). Another appointment was then rebooked for the patient. Sometimes patients required several rebookings or asked for appointments to be rescheduled several months away to make it easier for them to make the appointment. The category "referral to first seen" appointment reflects these factors.

The range in wait time to "first book" for the PreEASE group was 7-223 days with a mean wait time of 67.9 days (Table 8). The range for the "referral to first seen" wait time for the PreEASE group was from 7-293 days with a mean of 69.42 days. The range in wait time to "first book" for the EASE group ranged from 1-78 days with a mean wait time of 21.71 days. The range for the "referral to first seen" wait time for the EASE group ranged from 4-78 days with a mean of 23.60 days. A t-test for independent means was used to compare the categories of "referral to first book" and "referral to first seen" for PreEASE and EASE groups. The comparison indicated that the EASE group had significantly shorter wait times ($t=9.43, p<.0001$) in both "referral to first book" and "referral to first seen" categories.

Table 8

Comparison of Wait Time by Sample Groups

Referral to 1st book	PreEASE n=69	EASE n=69	t	Pvalue
Mean Days	67.19	21.71	9.43	<.0001
Minimum Days	7	1		
Maximum Days	223	78		
Standard Deviation	38.78	10.03		
Referral to 1st Seen				
Mean Days	69.42	23.60	9.43	<.0001
Minimum Days	7	4		
Maximum Days	293	78		
Standard Deviation	46.62	11.66		

Comparison of Wait Time by Age, Gender Health Region and Referral Reason

Age, gender, health region and referral reason were examined as possible influencing factors on wait time.

Age

The age categories were regrouped to determine if age had any effect on wait time (Table 9). The re-grouped categories included less than 40 years, 40 -60 years and more than 60 years. The wait time for PreEASE patients less than 40 years old was 96.83 days, from 40 – 60 years old was

66.07 days and more than 60 years old was 62.91 days. The EASE sample wait time for patients less than 40 years old was 20.73 days, for 40 – 60 year olds was 18.14 days and for more than 60 years old was 17.73 days. A one way analysis of variance (ANOVA) indicated that age had no effect on wait time for either the PreEASE group (p= 0.1393) or the EASE group (p=0.3569).

Table 9

Comparison of Wait Time vs. Age

Groups	Age <40 years	40 – 60 yrs	>60 yrs	F ratio	Prob
Pre EASE Mean Wait Days	96.83 n=6	66.07 n=29	62.91 n=34	2.03	0.1393
EASE Mean Wait Days	20.73 n=6	18.14 n=25	17.73 n=38	1.05	0.3569

Gender

PreEASE females waited 76.57 days for a cardiac consult compared to the males who waited only 60.78 days. Females in the EASE group waited 16.83 days for a cardiac consult compared to males who waited 21.13 days and this was a significant difference (p=0.0229). A one way ANOVA indicated that there was no relationship (p = .2191) between gender and the wait time to obtain a cardiac consultation in the PreEASE group. However in the EASE group based on gender there was a statistical difference (p=0.0229) (Table 10). It is unclear as to why this relationship exists and further analysis needs to be completed. On speculation, a possible reason could be the females

where referred for more urgent complaints and therefore requiring an earlier appointment.

Table 10

Comparison of Wait Time vs. Gender

Groups	Gender Male	Female	Prob
PreEASE Mean Wait Time	60.78 n=41	76.51 n=28	0.2191
EASE Mean Wait Time	21.13 n=37	16.83 n=32	0.0229

Health Region

Pre EASE wait times according to Health Region are as follows: Central Health Region 50.95 days, Capital Region 75.76, Northern Region 60.25 days and Other Region was 71.50 days. EASE wait times for the same regions are: Central Region 20.56, Capital Region 19.39 days, Northern Region 18.7, and Other Region 7.0 days. A one way ANOVA indicated that there was not relationship between wait time and region for either PreEASE ($p= 0.1151$) or EASE ($p= 0.13660$) groups (Table 11).

Table 11

Comparison of Wait time vs. Health Region

Groups	Health Region					
	Northern	Central	Capital	Other	F Ratio	Prob
PreEASE						
Mean	60.25	50.95	75.76	71.5	2.05	0.1151
Wait Time	n=4	n=21	n=42	n=1		
EASE						
Mean	18.70	20.52	19.39	7.0	1.91	0.1366
Wait Time	n=6	n=18	n=42	n=3		

Referral Reason

Referral reason was also examined as a possible influencing factor on wait time (Table 12). PreEASE wait time associated with referral for chest pain was 73.38 days, presyncope 72.0 days, other 70.35 days, arrhythmia 66.72 days, congestive heart failure 40.75 days and pre operative referral was 54.40 days. EASE wait time associated with chest pain was 20.40 days, presyncope 18.08 days, arrhythmia 18.52 days, congestive heart failure 21.0 days and other 19.00 days. A one way ANOVA indicated that referral reason did not significantly influence wait time for either the PreEASE ($p= 0.710$) or EASE ($p= 0.8033$) group.

Table 12

Comparison of Wait Time vs. Referral Reason

Group	Referral Reason							
	CP	Presyn	Other	Arrh	CHF	PreOp		
			Mean				F ratio	Prob
Pre EASE Mean Wait Time	73.38	72.0	70.35	66.72	40.75	54.4	0.59	0.7101
EASE Mean Wait Time	20.41	18.08	19.0	18.52	21.0	0	0.46	0.8033

Legend: CP= Chest Pain Presyn=Presyncope
Arrh=Arrhythmia CHF=Congestive Heart Failure
PreOp=Preoperative Assessment

Chapter 5

Discussion

The purpose of this study was to determine whether a multidisciplinary single point of entry clinic would decrease wait times for cardiology consultation. The research question guiding this study was to determine if utilization of a multidisciplinary general outpatient cardiology clinic would have an effect on wait times to obtain an initial cardiac consult. Data were gathered from randomly selected files of individuals seen before and after the inception of a multidisciplinary clinic in a large tertiary care facility in Western Canada.

Canadian Heart Disease Statistics

The Heart and Stroke Foundation of Canada indicates that 32% of all male deaths and 34% of all female deaths in 2002 were due to heart disease (Heart and Stroke Foundation of Canada, 2006). They also indicate that 54% of deaths are due to coronary artery disease, 21% to stroke, 16% due to other heart problems such as arrhythmias, cardiomyopathy or infective endocarditits; and the last 9% due to vascular problems such as atherosclerosis and hypertension. The foundation also suggests that the mean age for the development of heart disease for men is 55 and for women sometime following menopause.

Age & Gender Comparisons

Both PreEASE and EASE groups were fairly representative of the general population for age and gender when compared to the Heart and Stroke statistics. The range in age for the PreEASE group was 17.5-85.6

years with a mean age of 59.92. This group consisted of slightly more males (n=41) than females (n=28). The EASE group was very similar in relation to gender with 32 female and 37 male patients. The range in age was 23.6 – 90.25 years with a mean age of 59.8. The similarity in age range between the groups suggests homogeneity. Although the standard deviation is relatively large it is essentially the same for both groups.

In both Pre EASE and EASE groups the age grouping of 20 – 29 years had slightly more patients than the 30 - 39 year age grouping. This might be because the institution is affiliated with a major university. The student health services for the campus have sent referrals to both PreEASE and EASE groups which could account for the slight increase in the younger age category. The majority of referrals were for patient's aged 40 – 79 years (PreEASE 80%, EASE 84%). Referrals taper off after that point perhaps because there are fewer individuals living.

Referral Reason Comparison

The most common referral reason for either sample group was chest pain (PreEASE 32%, EASE 44%), which closely corresponds to the Heart and Stroke statistics indicating that the majority of cardiovascular deaths are due to coronary heart disease. There is a difference between the groups for the second most common referral reason. In the PreEASE group 16% of patients were referred for Coronary artery disease (CAD) assessment while in the EASE group 17.5% were referred for atrial fibrillation. The remaining referral reasons are scattered with no apparent relationship between the

PreEASE and EASE groups. This may be an accurate representation but the referral reasons for the two groups were entered into the database at different times. The EASE sample group had specific referral reasons outlined when the referrals were initially made to the clinic during 2004. The PreEASE sample was entered into the database in 2006. In 2006, the list for referral reasons was expanded to include categories that had not been part of the data base in 2004. The new categories added were: CAD assessment, abnormal ECG, Pre-operative assessment and hypertension. Therefore, there were more available referral reason options available when the PreEASE data was entered. This also meant more accurate identification of reason for referral.

Referring Health Region Comparison

For both sample groups 62% of patients were referred from the Capital Region which is made up of Edmonton and surrounding areas. The University of Alberta Hospital is located in Edmonton and is not only the referral base for Alberta north of Red Deer but also includes northern BC, Yukon and Northwest Territories and Saskatchewan. Central Alberta sends the second largest number of referrals to each sample group. Interestingly, East Central Health Region sent more referrals to the PreEASE group whereas David Thompson Health Region sent more referrals to the EASE group. This is mostly likely due to the fact that the two major cities in the David Thompson Health Region (Wetaskiwin and Drayton Valley) were committed to support the EASE clinic from its inception. There are no

referrals from southern Alberta as those referrals typically go to the major tertiary care institution in that region.

Wait Time

There is a statistically significant difference when wait times are compared between the PreEASE sample and the EASE sample. The demographic data indicates the samples are homogenous which makes the decrease in wait time likely due to the design of the EASE clinic rather than attributable to another variable.

The range for "referral to first book "is 7 to 223 days and the range for referral to "first seen" is 7 - 293 days. This wide variance in range is most likely due to the way different physicians operate their practice. In addition the referrals in the PreEASE group were to the Division of Cardiology, which does include specialized services such as Electrophysiclogy (EP), where traditionally referrals take longer. The patients in the sample who were seen within a very short time frame may have been of a more urgent nature.

The PreEASE wait time was 67.19 days for "referral to first book" and 69.42 to "first seen". In this case there is little difference between the "first appointment given" to the patient and the "actual appointment time". In some cases 60 days can be too long for a patient to wait for a cardiology consult especially since diagnostic testing is typically ordered after the first visit with the Cardiologist. Diagnostic testing can take another month or more to complete which makes the time to a working or final diagnosis approximately three months.

The Wait Time Alliance have produced the only wait list benchmarks to compare wait times for obtaining a cardiac consult in Canada. They recommended urgent referrals should be seen within seven days and scheduled referrals within six weeks (Wait Time Alliance for Timely Access to Health Care, 2005). While it was not noted if the referral was urgent or scheduled the mean wait time for referral to first book and seen for the PreEASE group is well over six weeks.

The Cardiac EASE clinic wait time mean referral to "first book" was 21.7 days and mean referral to "first seen" was 23.6 days. Again with this group there doesn't appear to be much difference between the timing of the first appointment and when the patient was actually seen in clinic. The range for referral to first book is 1 – 78 days and referral to first seen is 4 – 78 days. In this sample it also wasn't noted which patients were urgent and which were scheduled cases. It can be assumed the patients seen in shorter time frames were urgent patients.

There clearly isn't the large variance in standard deviation and range for wait times in the EASE sample as there is in the PreEASE group. This is may be due to the patients "belonging" to the EASE clinic rather than to individual physicians. All referrals are handled in the same manner with respect to triaging, arranging the diagnostic testing, and clinic visits. As stated earlier if a patient requires an earlier or later appointment the date doesn't have to be booked around a specific physician. The new arrangements are made for the next available appointment time. The Cardiac

EASE clinic also has access to EP service. There is one EP physician that has one EP EASE clinic per month. This also helps to decrease the wait time for this specialty service.

There are a variety of reasons why some patients did have longer wait times. In the EASE group longer wait times may be associated with a patient request for a specific time (e.g. 1 patient felt it was too soon to be seen and asked for the appointment to be made a month later) or the patient asked for the clinic to be rebooked so that the test was co-ordinated with their next clinic visit. Also, if the referral was for EP (depending when the referral was received and/or how many patients required this type of consult) this wait may have been extended. Often patients from out of town needed referrals rebooked and while the clinic visit could be rescheduled quickly, the diagnostic testing couldn't be arranged for one or two weeks.

The mean wait time for the EASE group was approximately three weeks, which falls within the benchmarks set by the Alliance. The other very important consideration with regards to the EASE clinic is the patients are not only seen within three weeks but also have their diagnostic testing completed in this time frame. This is essential as it provides the patient with reassurance that either nothing is wrong or more importantly they are given a diagnosis and can proceed to ultimate treatment for their condition.

With the NP and PharmD roles completing history and physicals at each EASE clinic an increased number of new patients can be seen in one afternoon clinic than could be seen by individual physicians. Typically in an

EASE clinic afternoon, six to eight new referrals will be seen including the EP EASE clinic. Most physicians who do the EASE clinic say they can only see three or four new referrals per afternoon in their own clinics. This helps to decrease wait times within the EASE clinic.

Age, Gender, Health Region and Referral Reason Wait Time Comparison

Over all age, health region and referral reason did not have any effect on wait time to obtain a cardiac consult. Females in the EASE group were found to have the shortest wait time.

Age

The PreEASE group under 40 years of age had the longest mean wait time of 96.83 days, which could be reflective of the assumption of urgency for referral in this age group. The wait times for the 40 – 60 year group at 66.07 days and the over 60 years age group at 62.91 days was very similar. The EASE group of less than 40 years was also found to have the longest mean wait time of 20.73 days. The mean wait time for the EASE groups for 40 -60 years was 18.14 and there was very little difference for over 60 years which was 17.72 days. These wait times indicate that age is not related to wait times for cardiac consult.

Gender

Gender was not an influencing factor on wait times for the PreEASE group with wait time for males at 60.78 days and females at 76.57 days. This

is in contrast to the EASE group where there was a statistical difference between wait time for males and females. Males had a wait time of 21.12 days and females a wait time of 16.83 days. This is in contrast to other literature that has been published in the past with regards to gender bias suggesting females wait longer for cardiac investigations (Jaglal, 1994; Naylor, 1993; Roger, 2000). For this reason the EASE female patients were analyzed further with regards to age, urgency of referral and referral reason (Table 13 & 14). Females accounted for 100% of EASE patients in the age categories, 80-89 years and 90-99 years (correlates with current data indicating women live longer than men), 27% of the patients in the 70 – 79 years and approximately 50% for each of the 40-49, 50-59 & 60-69 year groupings. 31% of females referred to the EASE clinic were for urgent referrals; 6 chest pain, 1 valvular heart disease, 1 congestive heart failure and 2 for shortness of breath. The difference in wait time could be related to many variables and needs to be studied further to understand the meaning and causes of the difference. This data is applicable to this group only and can't be referred to other populations. Ghali (2002) stressed that it is imperative to consider all variables which may have an effect on final outcomes or false/misleading interpretations could be made.

Table 13

EASE Females – Age range (years)
n=32

40-49	50-59	60-69	70-79	80-89	90-99
8	7	7	4	5	1

Table 14

EASE Females – Referral Reason by urgency score

	Urgent N=10	Average n=22
Chest Pain	6	6
Valvular Heart Disease	1	3
Congestive Heart Failure	1	0
Shortness of Breath	2	3
Atrial Fibrillation	0	4
Palpitations	0	4
Syncope	0	1
Other	0	1

Health Region

There was no relationship between referring health region and wait time. This is a very important finding since the University of Alberta Hospital has a referral base extending into distant provinces and territories. Being able to provide the same quality of health care to all of this population is imperative.

The PreEASE group shows the Capital health region as having the longest wait times at 75.76 days followed by Other at 71.5 days. The Northern health region group had a wait time of 60.25 days and in the Central health region mean wait times were 50.95 days. The EASE sample indicates the health regions Central (20.56 days), Capital (19.39 days) and Northern (18.70 days) are very similar. The "other" group with a mean of 7 days included individuals with urgent referrals.

Referral Reason

Referral reason guides the diagnostic testing that must be completed in order to determine a diagnosis. In the PreEASE population was usually completed after the consult session but in the EASE setting it is completed prior to the consult. It may also guide the urgency of the cardiac consult.

The PreEASE Chest Pain referral group had the longest wait time of 73.38 days compared to the CHF group with 40.75 days, which most likely reflects the urgency of referrals for CHF. The Preoperative consult group had the second lowest wait time of 54.40 days which may also be reflective of the urgency of referrals as this group of patients is often waiting for life saving

operations. Presyncope (72.0 days) and "Other" (73.35 days) have a very similar wait times and the Arrhythmia group had a wait time of 66.72 days.

The EASE Presyncope group had the shortest wait time of 18.08 days while the CHF group had the longest wait time of 21.0 days. However, the CHF group also has one of the largest standard deviations, which most likely reflects the fact that some CHF patients require a more urgent consult than others. Referrals for arrhythmia (18.52 days), "other" (19.00 days) and chest Pain (20.41 days) all had essentially the same wait time. The wait time to obtain a cardiac consultation for the EASE group over all indicates there is essentially no difference in wait time related to referral reason. Ordering the diagnostic testing prior to the consult doesn't appear to affect the wait time. However Cardiac EASE does employ a .5 FTE echocardiogram and an electrocardiogram technician. This is an important factor as it allows for earlier appointments and availability of diagnostic testing which in turn allows for earlier consult appointments.

Limitations of the Study

There are several limitations to this study. This was not a randomized control trial as all patient referrals to the Cardiac EASE clinic were assessed in the same manner. Whether or not they signed the consent didn't change their treatment regime. Therefore an exact comparison cannot be made.

This was a comparison trial using retrospective data. Individual physician's secretaries collected the pre trial comparison group data. Ideally an impartial person should collect the data to ensure the data's quality and

reliability. Some wait times documented for the PreEASE group did not correspond to traditionally known wait times for specific cardiologists. Also since the data collected was retrospective, if data was missing, it couldn't be included (i.e. accurate referral reason - if the referral letter couldn't be located the referral reason was determined from the consultants letter for the PreEASE sample). This has implications not only for describing the population but also assists with determining which diagnostic tests needed to be ordered.

This study was limited to referrals sent specifically to the Cardiac EASE Clinic. There was no advertising of the existence of the clinic, except for "word of mouth" communication. This was intentional due to the limitations of clinic financing and growth potential. Limiting communication on the existence of the clinic may have implications for the number of patients referred to the clinic, which ultimately might affect wait times.

Clinical Implications

The wait time for the Cardiac EASE clinic was approximately three weeks compared to two months for the PreEASE sample. The decrease in wait time indicates the benefits of utilizing the resources of a multidisciplinary clinic, especially the advanced roles of NP's and PharmD's. By utilizing these roles to their full scope of practice cardiologists can be "freed up" to see an increased number of new referrals and increase the efficiency of clinics. Both the NP role and the PharmD role can effectively triage patients for timely

consultation and arrange for essential diagnostic testing to be completed before the initial appointment.

Establishing a database to store and record patient data is essential to the clinic. To have the database ready to utilize when patients are first seen (or the clinic is initiated) would be extremely beneficial to ensure the data collected is accurate and complete. It would also be beneficial for all person's utilizing the database to be well informed on how it functions and how data should be entered.

Planning for yearly growth is paramount in establishing a clinic and having it flourish. The Cardiac EASE clinic started with approximately 400 patients in 2003. There are now over 4200 patients in the data base. The clinic has proven to be a success but the clinic is limited in expanding, as there is no physical room to see additional patients.

A committed staff of cardiologists is also required to provide coverage for all available clinic time. Even more important is a dedicated medical director for the clinic who is willing to address any problems or issues that arise. The medical director is also required to answer questions with respect to triage and follow up questions from the NP or PharmD. Two and one half full time equivalent advanced roles are currently filling the needs of the EASE clinic. Two full time positions are directly involved in the triaging, booking, clinic time and follow up of the patients. A half time full time equivalent role is involved in the actual clinic time. There are two full time secretaries who are committed to notifying all patients, completing transcription and fulfilling other

office duties. As mentioned the clinic is unable to expand currently because of space but ultimately more funding is also required to increase staffing equivalents if more patients are to be seen. The clinic would be best staffed with three or four advanced roles if clinics were to be offered every morning and afternoon. This would allow two NP's/PharmD's to be in clinic for half a day each, allowing the other two NP's/PharmD's to triage and complete follow up. There are also numerous patients calling the clinic with questions that need to be answered by someone in one of the advanced roles. Having NP's or PharmD's available at all times would assist with patient care. If more patients are seen, an increase in secretarial support would also be required, as would an increase in staffing for the echocardiogram and electrocardiogram staff. If all the staff are committed to the mandate of the clinic and how it operates, the outcome is more likely to be successful.

Conclusion

The Canadian health care system is currently under scrutiny for long wait times for specialty medical consultations. Currently, wait times to see a cardiologist can vary from 3 to 4 months. In 2003 the Cardiac EASE clinic was established as a possible solution to the wait time dilemma. Utilizing NP's and PharmD's in collaboration with cardiologists has had a positive effect on decreasing wait times to obtain a cardiac consult. By obtaining cardiac consults earlier improved patient outcomes can be achieved as decisive treatment can be started sooner and/or reassurance given. This study adds to knowledge about possible ways to expedite the progression of

cardiac patients from point of contact with the health care system to actual cardiac consult when consultation is required. The EASE approach has been proven effective in decreasing wait times and could act as a prototype for implementation in tertiary care centres across Canada. This type of program might also be useful for other outpatient consult services.

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Patient Information Sheet / Consent

Title of Project: The Cardiac EASE (Ensuring Access and Speedy Evaluation) Program

Principal Investigator: Dr. Stephen Archer

Co-Investigators: Dr. Tammy Bungard
Marcie Smigorowsky
Dr. Lucille Lalonde
Dr. Glen Pearson

Purpose of Program: The goal of the Cardiac EASE (Ensuring Access and Speedy Evaluation) is to simplify the process of getting patients in to see a cardiologist, to decrease the amount of time it takes for a patient to see a cardiologist, and to ensure that once the patient sees the cardiologist all information is present to offer the necessary care.

How Things Are Now: Heart disease is the leading cause of death in Alberta. Seeing a cardiologist is often the first step in being tested for heart disease and having treatments started. Within Alberta, most patients must wait three to five months to be seen by a cardiologist. This wait may put people at risk of the progression of heart disease (i.e., chest pain, heart attack, death). This wait is long due to a limited number of cardiologists and perhaps due to the way people are now being referred and booked to see a cardiologist. Currently, a person is referred to a cardiologist by contacting their secretary to book the appointment. In this manner, the degree of urgency for seeing the cardiologist is not determined. Often certain necessary tests are not available at the time the person sees the cardiologist. This requires a further delay to complete these tests and then see the cardiologist again. This results in delays in diagnosis and treatment.

How Cardiac EASE will change this: This program intends to meet its goal by providing your family doctor with a single 1-800 telephone number to gain access to a cardiologist. This number will be answered by members of the Cardiac EASE team who will ensure people are seen sooner if their situation is more urgent, the choice of seeing the cardiologist able to see them the soonest is offered, and that all information required for the visit with the cardiologist is done and available for review at the time of the visit. To make best use the cardiologist's time, a team of other health care providers will be involved in your care. This includes both a nurse and pharmacist that have advanced training. By changing the way people are booked for visits and then seen by cardiologists, this program aims to allow cardiologists to see more patients and thereby reduce the length of time taken to wait to see a cardiologist. If you are close to an area having the ability to use telehealth (equipment allowing you to be seen through a television-like monitor and, in turn, see the EASE team at the University of Alberta through a monitor), this may be offered to you to avoid travel to Edmonton.

Importance of Evaluation: The Cardiac EASE program is new and unique to our health region. As such, we want to assess how well the program manages your consultation with cardiologists at the University of Alberta hospital. In order to do this, we will need to look at some of your medical records. This would include looking at your medical appointment bookings, diagnostic test results, and information from your medical record. Also, if you are admitted to the hospital, it would include looking at your medical record to determine why you were admitted, how long you spent in hospital, and any test results, etc. You will be asked to complete a survey to determine whether or not you are satisfied with the care you receive through this program. This survey, along with information collected

from your medical records, such as medical appointment bookings and diagnostic test results, will determine whether or not the Cardiac EASE program is achieving its goals. All of this information will be kept at the University of Alberta Hospital.

Benefits of the Program: You will have the opportunity to ask any questions you may have about heart disease. This program aims to reduce the amount of time you need to wait to see a cardiologist and to reduce the number to times you will need to come to Edmonton to be seen by a cardiologist.

Possible Risks: There are no risks to participating in this study. There will be no costs to you by participating in this study.

Confidentiality: Personal records relating to this study will be kept confidential. Only the investigators will have access to the information collected. Reports published as a result of this study will not identify you by name. All evaluation information will be kept at the University of Alberta Hospital.

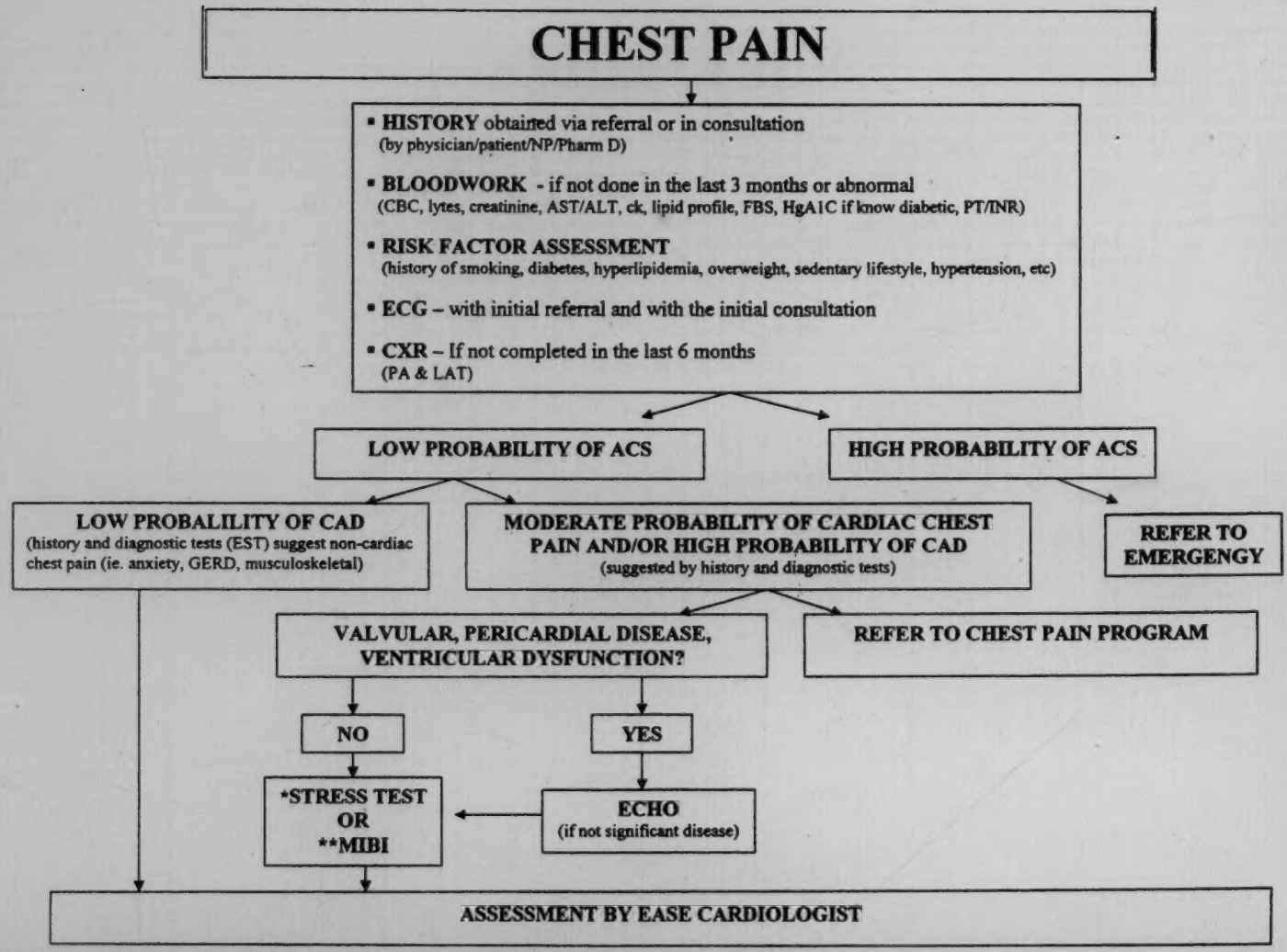
We appreciate your consideration of participation in this study.

If you have any concerns about any aspect of this study, you may contact the Patient Concerns Office of the Capital Health Authority at (780) 407-1040. This office has no affiliation with study investigators.

If you have any questions or concerns, please contact the Cardiac EASE office at 407-1095 or toll free at 1-866-407-1094.

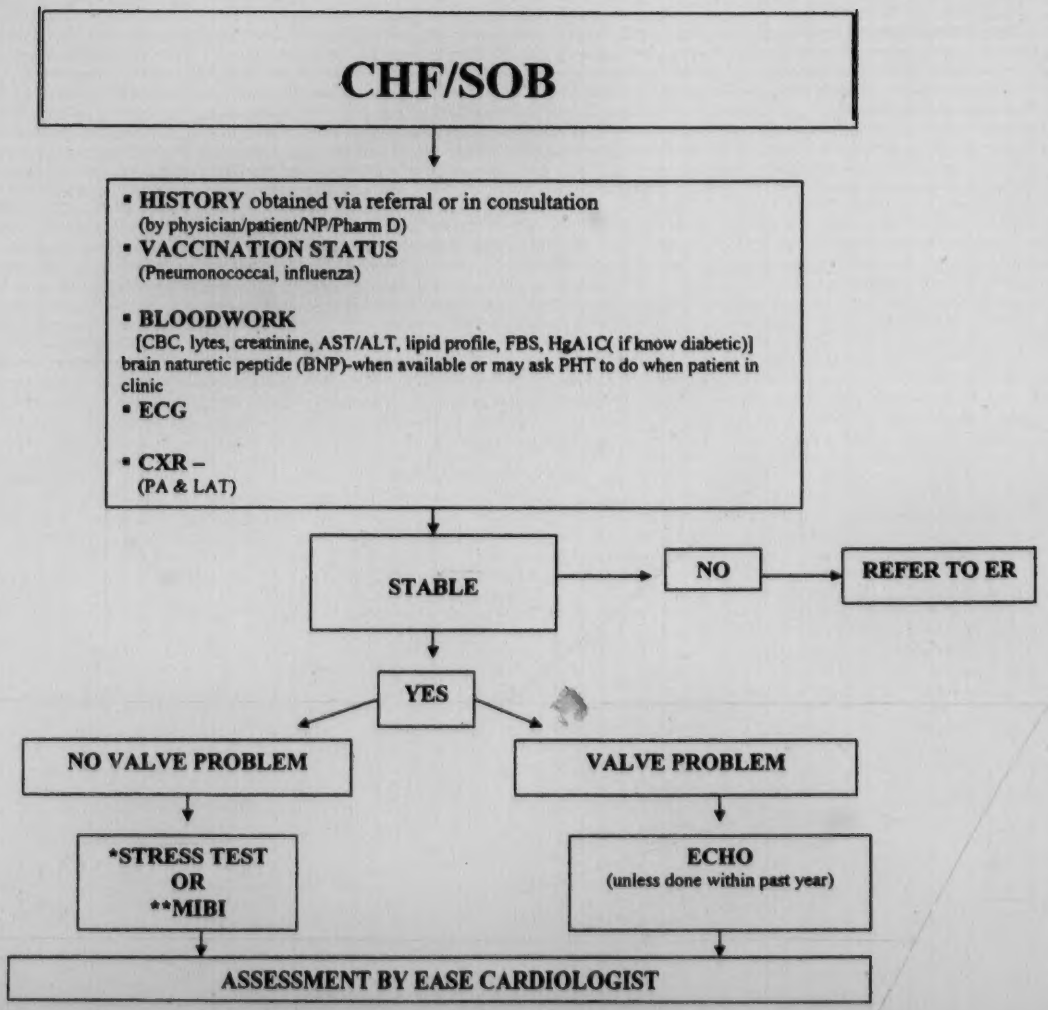
You signature on this form indicates that you have understood to your satisfaction the information regarding your participation in this project. You are free to withdraw at any time without having to give a reason and without affecting your medical care.

Signature of Research Subject	Printed Name	Date
Signature of Witness	Printed Name	
Signature of Researcher	Printed Name	


CHEST PAIN
HISTORY obtained via referral or in consultation
(by physician/patient/NP/Pharm D)
BLOODWORK - if not done in the last 3 months or abnormal
(CBC, lytes, creatinine, AST/ALT, ck, lipid profile, FBS, HgA1C if know diabetic, PT/INR)
RISK FACTOR ASSESSMENT
(history of smoking, diabetes, hyperlipidemia, overweight, sedentary lifestyle, hypertension, etc)
ECG – with initial referral and with the initial consultation
CXR – If not completed in the last 6 months
(PA & LAT)
LOW PROBABILITY OF ACS
HIGH PROBABILITY OF ACS
LOW PROBALILITY OF CAD
(history and diagnostic tests (EST) suggest non-cardiac chest pain (ie. anxiety, GERD, musculoskeletal)
MODERATE PROBABILITY OF CARDIAC CHEST PAIN AND/OR HIGH PROBABILITY OF CAD
(suggested by history and diagnostic tests)
REFER TO EMERGENGY
VALVULAR, PERICARDIAL DISEASE, VENTRICULAR DYSFUNCTION?
REFER TO CHEST PAIN PROGRAM
NO
YES
*STRESS TEST OR **MIBI
ECHO
(if not significant disease)
ASSESSMENT BY EASE CARDIOLOGIST

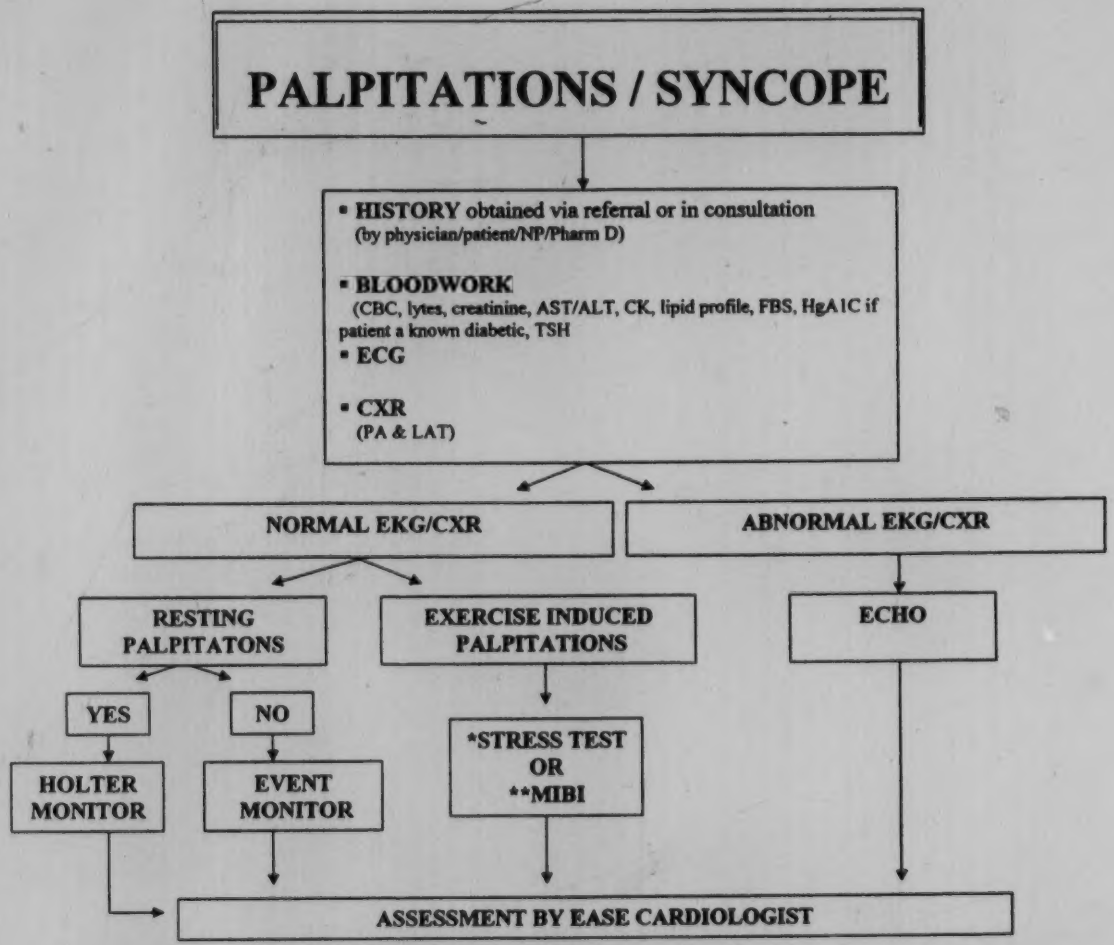
* Stress test if patient is able to exercise and does not have criteria for MIBI.

** MIBI required if patient is unable to exercise, ECG shows LBBB, LVH, resting ST depression ≥ 1. mm, or if previous stress test is inconclusive



* Stress test if patient is able to exercise and does not have criteria for MIBI.

** MIBI required if patient is unable to exercise, ECG shows LBBB, LVH, resting ST depression ≥0.5 mm, or if previous stress test is inconclusive



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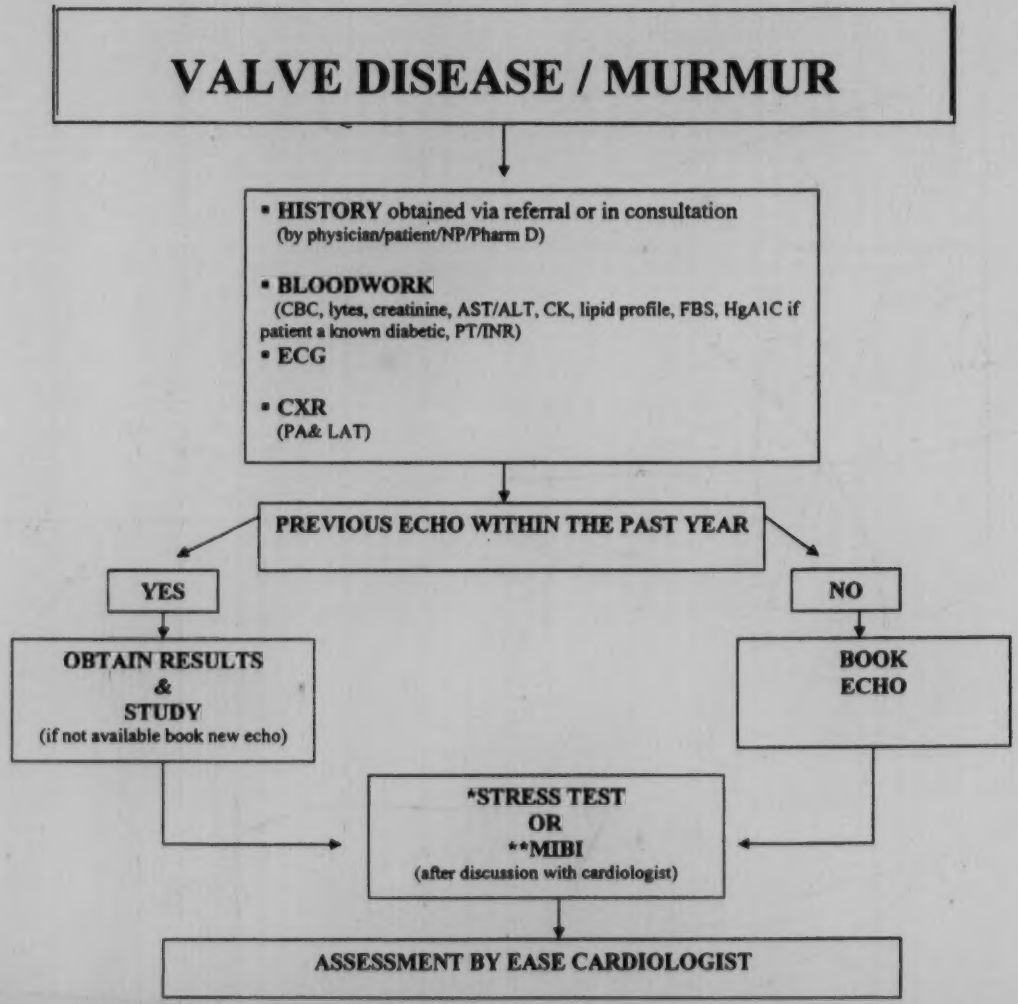
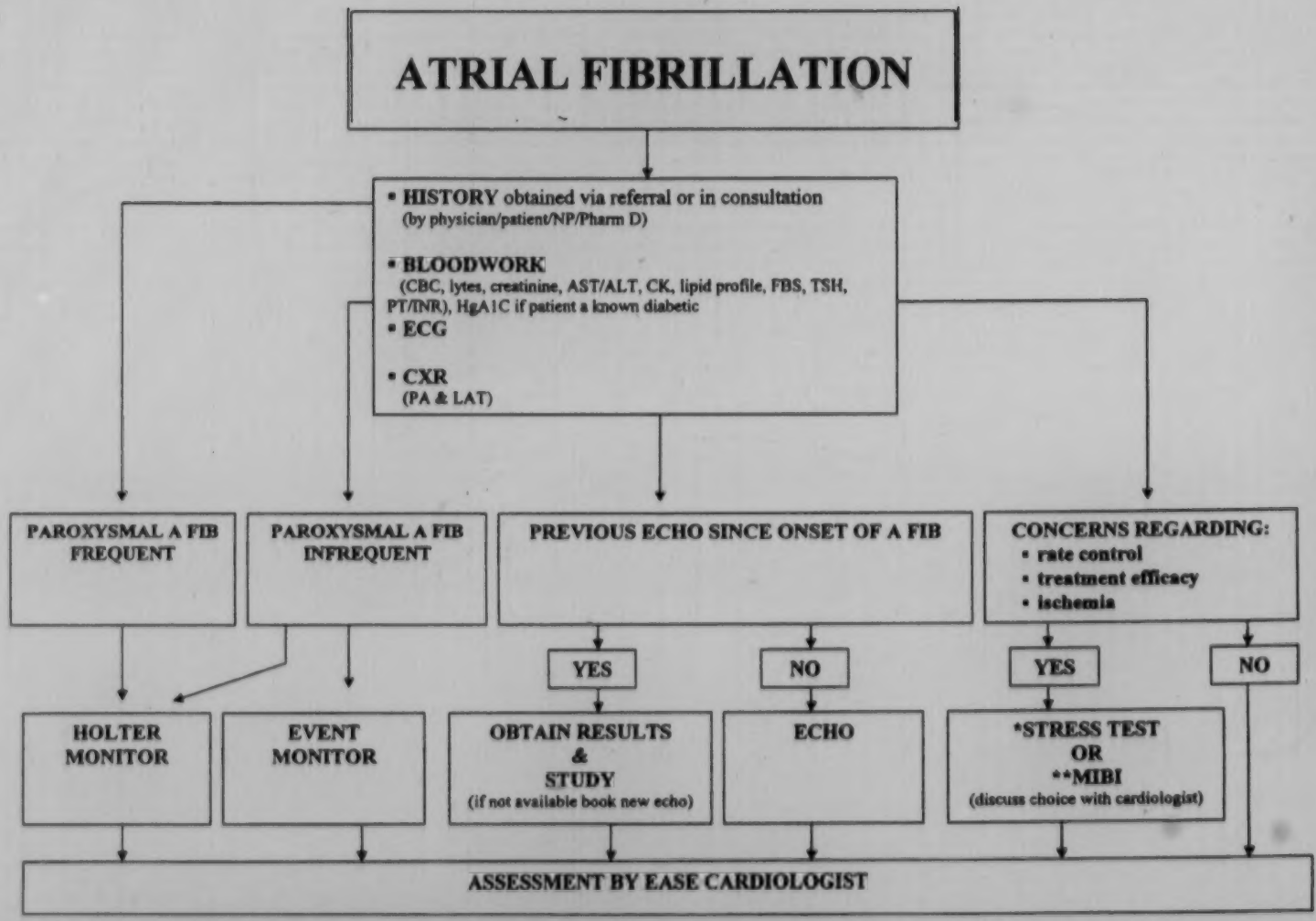

VALVE DISEASE / MURMUR
• HISTORY obtained via referral or in consultation
(by physician/patient/NP/Pharm D)
• BLOODWORK
(CBC, lytes, creatinine, AST/ALT, CK, lipid profile, FBS, HgA1C if patient a known diabetic, PT/INR)
• ECG
• CXR
(PA& LAT)
PREVIOUS ECHO WITHIN THE PAST YEAR
YES
NO
OBTAIN RESULTS & STUDY
(if not available book new echo)
BOOK ECHO
*STRESS TEST OR **MIBI
(after discussion with cardiologist)
ASSESSMENT BY EASE CARDIOLOGIST

* Stress test if patient is able to exercise and does not have criteria for MIBI.

** MIBI required if patient is unable to exercise, ECG shows LBBB, LVH, resting ST depression ≥0.5 mm, or if previous stress test is inconclusive



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Capital Health
University of Alberta Hospital

Cardiac EASE Program

Patient History & Physical Form

Referring MD_____ Family Physician _____
Previous Cardiologist_____

CC:_____

HPI & Cardiac Systematic Review:_____

Past Cardiac History:

☐ Prior MI: Date _____ ☐ Prior PTCA: Date_____
☐ Prior Cath: Date _____ ☐ Prior CABG: Date_____
☐ Other CV _____

Cardiac Risk Factors:

Age _____ Gender ☐ Male ☐ Female
Diabetes ☐ NIDDM ☐ IDDM _____ years ☐ Dyslipidemia _____
Smoker ☐ Y _____ pack years ☐ N_____ quit ☐ Sedentary lifestyle ☐ Y ☐ N
☐ HTN _____ years ☐ treated ☐ untreated Postmenopausal ☐ Y ☐ N _____ years
☐ Family history of CAD_____

Social History:

Occupation_____ Residence/Living Arrangements_____
Alcohol use_____ Elicit drug use _____

Pertinent Medical History: _____

SURGERIES:_____

Allergies: ☐ NKDA ☐ IV Contrast ☐ Medication_____

Current Medications:

Name	Dose	Name	Dose	Name	Dose
OTC Meds:					
Herbal Products:					

Capital Health
University of Alberta Hospital

Patient History & Physical Form - Continued

SYSTEMS REVIEW:
ENT/NEUROLOGIC_____
CARDIOVASCULAR_____
RESPIRATORY_____
GI_____
GU/ GYN_____
MUSCULOSKELETAL_____
DERMATOLOGIC_____
ENDOCRINE_____

PHYSICAL EXAMINATION:

BP (sitting): Rt _____ Lt _____ BP (standing): _____ Rt/Lt HR_____
HT_____WT_____BMI_____

CNS: ☐A&O x 3 ☐ Other_____

CVS: ☐ Carotid pulse Volume_____Contour_____Bruit: Carotid/Femoral ☐ Rt ☐ Lt ☐ None
JVP _____ cm ASA Waveform _____ Apex at _____ ☐ Thrills_____
☐ S_1 ☐ S_2 ☐ S_3 ☐ S_4 ☐ Murmur - describe _____
Peripheral pulses: Femoral _____ Pedal _____ Radial_____
Allen Test: ☐ Done ☐ Not Done ☐ Edema _____ ☐ Other_____

CHEST: Air Entry ☐ Crackles ____ ☐ Wheezes____ ☐ Clear Bilaterally ☐ Other _____
ABD: _____

IMPRESSION:_____
_____
_____
_____

PLAN:_____
_____
_____

Tests Pending: Angiogram Echocardiogram Stress test→ Treadmill MIBI
Holter Event Recorder EKG

FOLLOW-UP:
Admitted to Hospital:
Day seen in EASE Soon after seen in EASE (not directly admitted due to bed shortage)

Follow-up with:
Family Doctor
Cardiologist
cardiologist seen in EASE but outside of EASE their original cardiologist
By EASE only if pending testing alters decision
EASE, specify:
In-person Phone Telehealth, then (check all that apply):
Cardiologist NP / PharmD

Other, specify: _____

Assessed by_____ Attending Physician_____ Date_____

VISIT NUMBER_____

EASE Patient Triage

Severity Scale _____
(Urgent = 1, Neutral or Average = 2, Non-Urgent =3)

Name: _____
Date Referred: _____
Date Offered: _____
Date Booked: _____
Physician: _____
UAH#: _____ PHN #: _____
Out of Town: Yes____ No____ Entered into Database: Initial_____
Complete_____

Patient Referred for:

- ATRIAL FIBRILLATION/FLUTTER
- CARDIAC REHABILITATION
- CARDIAC RISK ASSESSMENT
- CONGESTIVE HEART FAILURE/SHORTNESS OF BREATH
- CHEST PAIN
- PALPITATIONS/SYNCOPE/PRESYNCOPE
- PREOPERATIVE CONSULT
- VALVE DISEASE
- PRETRIAL/TREATMENT CLEARANCE
- OTHER, SPECIFY _____
- ABNORMAL ECG
- ARRHYTHMIA
- EP ASSESSMENT
- CAD ASSESSMENT
- CONGENITAL HEART DISEASE
- EDEMA
- IMMIGRATION CLEARANCE
- NEW MURMUR
- HYPERTENSION
- PERICARDIAL EFFUSION

Tests to be ordered:

BLOODWORK

- HGA1C
- alk phos
- ALT
- AST
- bilirubin
- BUN
- CK
- CBC & differential
- creatinine
- dig levels
- fasting blood sugars
- fasting lipids
- lytes
- magnesium
- PT/INR
- TSH

APPROACH QUESTIONARE: Yes/NO

- **ECG**
- **CXR**
- **ECHO**
- **HOLTER**
- **EVENT RECORDER**
- **STRESS TEST**
- **MIBI**
- **OTHER**

Available:

Previous Cardiologist:

Exercise:

CXR/ECG:

Other Appointments:

Phone Number while in Edmonton:

Follow-up

- Return to EASE
- No further follow-up
- Other_____
- GP
- Referral to _____

Capital Health

Cardiac EASE

NEW PATIENT REFERRAL FORM

CARDIAC EASE CLINIC

university of alberta hospitals

PATIENT INFORMATION: Date of Referral:_____

Patient Name:_____ ☐ Male ☐ Female

DOB:(dd/mm/yy)_____ PHN:_____ UAH#:_____

Address:_____ Postal Code:_____

Phone #(home): (business):

REASON FOR REFERRAL:

☐ Atrial Fibrillation
☐ Palpitations
☐ Valve Disease
☐ Other, Specify_____
☐ Congestive Heart Failure/Shortness of Breath
☐ Chest Pain

HISTORY:_____

CURRENT MEDICATIONS:

Name	Dose	Name	Dose

PREVIOUS TESTING: (please fax reports with form if applicable)

☐ Chest x-ray ☐ MIBI ☐ Holter
☐ Exercise Stress Test ☐ Echocardiogram ☐ Other_____

CURRENT INVESTIGATIONS: (please fax with form)

☐ Emergency Department chart ☐ ECG ☐ Laboratory results

REFERRING PHYSICIAN INFORMATION:

Referring Physician:_____ M.D.

Address:_____ Postal Code:_____

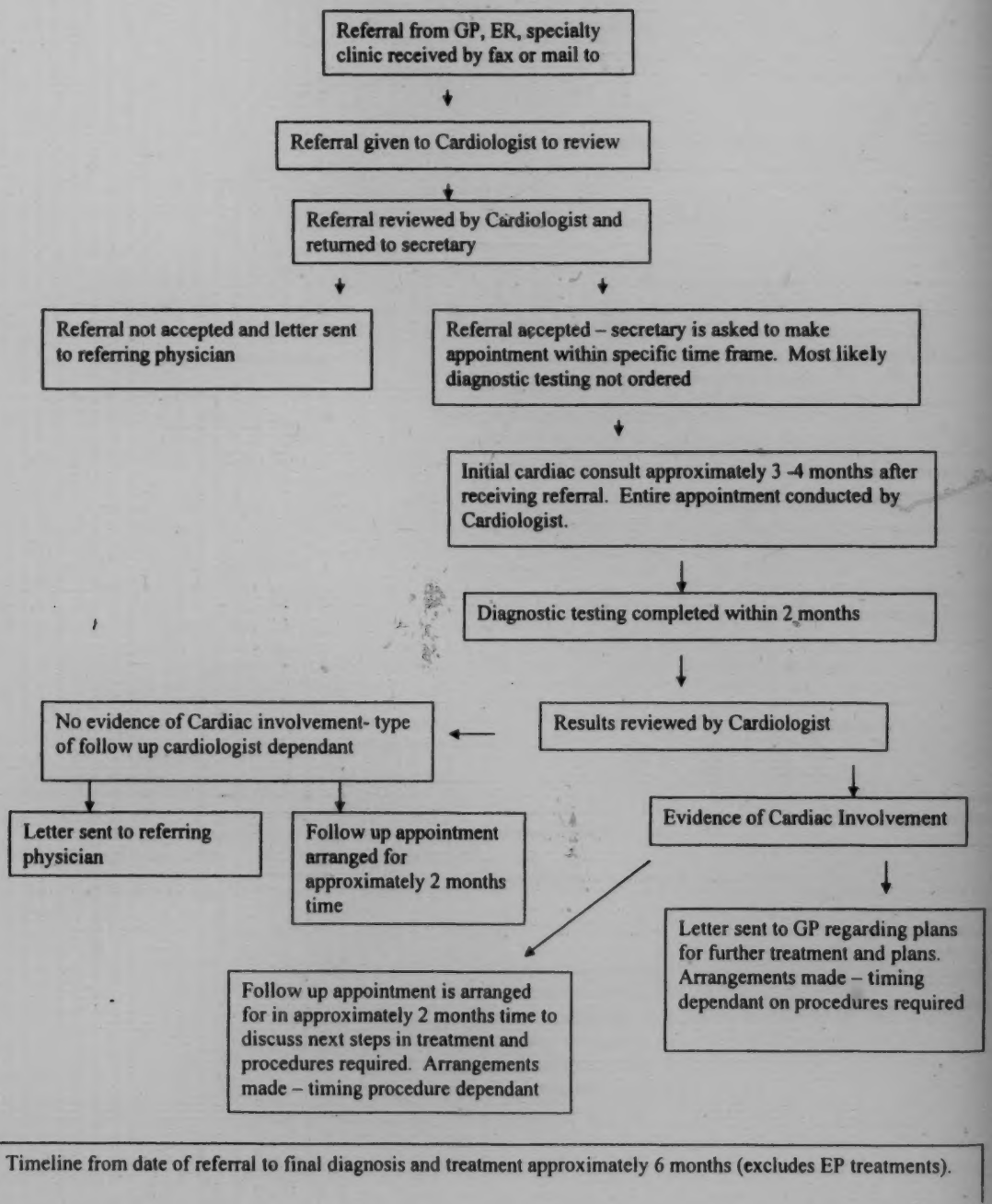
Phone #:_____ Fax #:_____

Signature:_____ M.D.

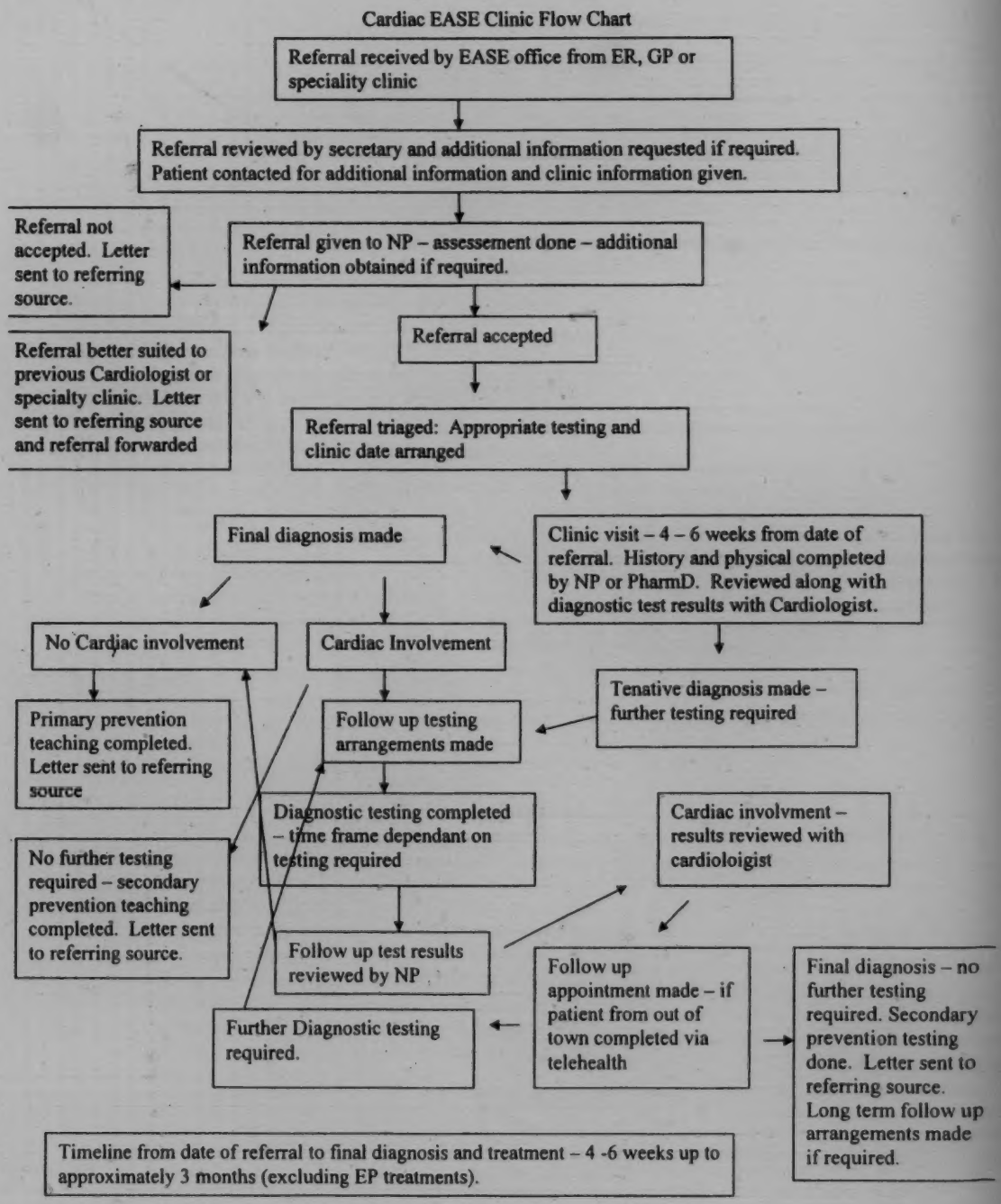
Please fax this form and additional documents to the Cardiac EASE Clinic (780) 407-1091

University of Alberta Hospital
2C2 Walter Mackenzie Centre
8440 - 112 Street
Edmonton, Alberta T6G 2B7
Phone: (780) 407-1095 Toll Free: 1(866)407-1094
Fax: (780) 407-1091

Traditional Cardiology Consult Referral Process

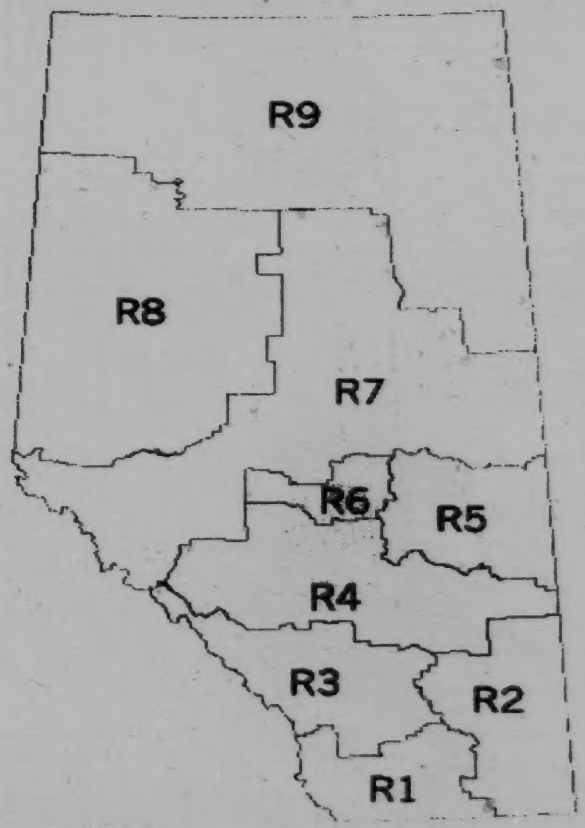

Referral from GP, ER, specialty clinic received by fax or mail to
Referral given to Cardiologist to review
Referral reviewed by Cardiologist and returned to secretary
Referral not accepted and letter sent to referring physician
Referral accepted – secretary is asked to make appointment within specific time frame. Most likely diagnostic testing not ordered
Initial cardiac consult approximately 3 -4 months after receiving referral. Entire appointment conducted by Cardiologist.
Diagnostic testing completed within 2 months
Results reviewed by Cardiologist
No evidence of Cardiac involvement- type of follow up cardiologist dependant
Letter sent to referring physician
Follow up appointment arranged for approximately 2 months time
Evidence of Cardiac Involvement
Letter sent to GP regarding plans for further treatment and plans. Arrangements made – timing dependant on procedures required
Follow up appointment is arranged for in approximately 2 months time to discuss next steps in treatment and procedures required. Arrangements made – timing procedure dependant

Timeline from date of referral to final diagnosis and treatment approximately 6 months (excludes EP treatments).


Cardiac EASE Clinic Flow Chart
Referral received by EASE office from ER, GP or speciality clinic
Referral reviewed by secretary and additional information requested if required. Patient contacted for additional information and clinic information given.
Referral not accepted. Letter sent to referring source.
Referral given to NP – assessement done – additional information obtained if required.
Referral better suited to previous Cardiologist or specialty clinic. Letter sent to referring source and referral forwarded
Referral accepted
Referral triaged: Appropriate testing and clinic date arranged
Final diagnosis made
Clinic visit – 4 – 6 weeks from date of referral. History and physical completed by NP or PharmD. Reviewed along with diagnostic test results with Cardiologist.
No Cardiac involvement
Cardiac Involvement
Tenative diagnosis made – further testing required
Primary prevention teaching completed. Letter sent to referring source
Follow up testing arrangements made
Diagnostic testing completed – time frame dependant on testing required
Cardiac involvment – results reviewed with cardioloigist
No further testing required – secondary prevention teaching completed. Letter sent to referring source.
Follow up test results reviewed by NP
Follow up appointment made – if patient from out of town completed via telehealth
Final diagnosis – no further testing required. Secondary prevention testing done. Letter sent to referring source. Long term follow up arrangements made if required.
Further Diagnostic testing required.
Timeline from date of referral to final diagnosis and treatment – 4 -6 weeks up to approximately 3 months (excluding EP treatments).

Map of Alberta Regional Health Authorities

Region 1 – Chinook
Region 2 – Palliser
Region 3 – Calgary
Region 4 – David Thompson
Region 5 – East Central
Region 6 – Capital
Region 7 - Aspen
Region 8 – Peace Country
Region 9 – Northern



Adapted from: http://www.health.gov.ab.ca/regions/RHA_map.html

Health Research Ethics Board

213 Heritage Medical Research Centre
University of Alberta, Edmonton, Alberta T6G 2S2
p.780.492.9724 (Biomedical Panel)
p.780.492.0302 (Health Panel)
p.780.492.0459
p.780.492.0839
f.780.492.7808

HEALTH RESEARCH ETHICS APPROVAL FORM

Date: February 2007

Name of Applicant: Beverley A. Williams

Organization: U of A

Department: Faculty of Nursing

Project Title: The Effect of a Multidisciplinary Outpatient Clinic on Wait Times for Cardiology Consult

The Health Research Ethics Board (HREB) has reviewed the protocol for this project and found it to be acceptable within the limitations of human experimentation. The HREB has also reviewed and approved the subject information letter and consent form.

The approval for the study as presented is valid for one year. It may be extended following completion of the yearly report form. Any proposed changes to the study must be submitted to the Health Research Ethics Board for approval. Written notification must be sent to the HREB when the project is complete or terminated.

Special Comments:

The Research Ethics Board assessed all matters required by section 50(1)(a) of the Health Information Act. The REB Panel determined that the research described in the ethics application is a retrospective chart review of clinic files where patients consented to the use of their information for research purposes at the time of presentation to the clinic.

Dr. Glenn Griener, PhD
Chair of the Health Research Ethics Board
(B: Health Research)

FEB 0 8 2007
Date of Approval Release

File Number: B-140207

UNIVERSITY OF ALBERTA

Capital Health
Edmonton and area

CARITAS HEALTH GROUP